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SPECIAL REPORT

Get Smart

When knowledge in a particular area is lacking, learn about options for training before signing up

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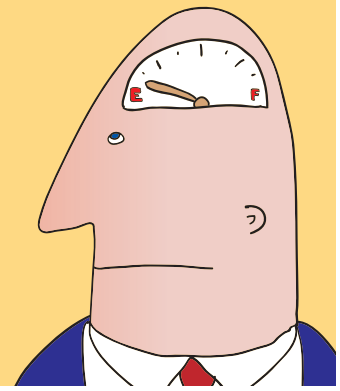

Awaiting a Tools Buyer, Borland Restarts Turbo

BY JENNIFER DEJONG

On the verge on naming a buyer for its tools group, Borland Software has revived its Turbo brand, which dates back to the company's 1983 beginnings.

Borland announced last month Turbo Delphi for Win32, Turbo Delphi for .NET, Turbo C++ and Turbo C#. Aimed at students, hobbyists and other individual developers, the tools are essentially single-language versions of Borland Developer Studio, the company's development environment for Microsoft Windows and .NET applications. Bringing back the Turbo line "re-ups our focus

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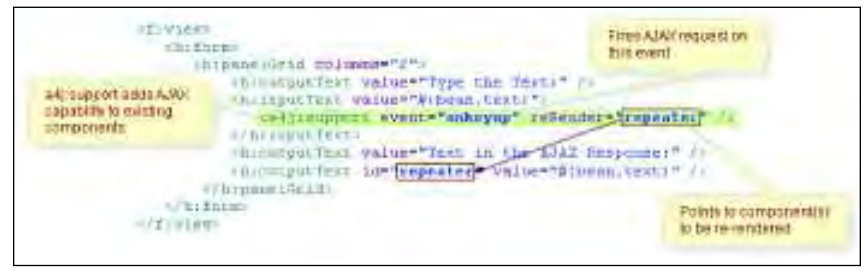
Turbo helps refocus Borland on developers, says Intersimone.

Sun Eyes Baking AJAX Functionality Into JSF

BY ALEX HANDY

With JSF/AJAX components from Exadel and IceSoft paving the way, the combination of JavaServer Faces and Asynchronous JavaScript and XML could become a focal point for the next revision of JSF.



Exadel's AJAX4JSF components render XML and HTML with AJAX functionality.

In August, Exadel posted an open-source project on Java.net consisting of 25 AJAX components for JSF. And in July, IceSoft released its enterprise edition of IceFaces, its own set of AJAX components for use with JSF. Now, Sun Microsystems is talking to both companies about how these functionalities can be integrated into JSF 2.0.

ABOUT 3 IN 4 USE AJAX
PAGE 12

Ed Burns, Sun's lead developer of JSF, explained why he believes JSF and AJAX mix so well. "When you have an individual JavaScript library sending data back up to the server without regard for what's happening on the server, then you're limited on what the server side can do," he said, creating

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U.S. Leadership on Cybersecurity 'AWOL'

Homeland Security stalled on naming czar, accepting development guidance

SD Times Photo Illustration: Mara Leonardi

BY JENNIFER DEJONG

How secure is cyberspace?

Not very—if the U.S. Department of Homeland Security's lack of attention to the issue is any indication.

The position of DHS cybersecurity chief has been vacant for nearly two years. And while sources concerned with cybersecurity issues said the DHS is close to naming an acting assistant secretary for cybersecurity and telecommunications, the appointment is likely to be seen as little more than a stopgap measure.

"We are operating without a cyberspace czar," said Ron Moritz, chief security officer for Islandia, N.Y.-based software company CA. He declined to comment on whether the DHS appointment is imminent. But he said that until DHS names a permanent official to head its cybersecurity effort, the private sector cannot establish a true partnership with government around this issue. "It is important that a permanent DHS [assistant secretary for cybersecurity] be put in place quickly."

Among other things, the lack of leadership has left DHS unable to respond to a set of recommendations for developing secure software, drafted in 2004 by a task force known as Improving Security Across the Software Development Lifecycle. The group created a body of knowledge, and Moritz, who co-chaired the task force with Microsoft vice president of trustworthy computing Scott Charney, said, "It is frustrating not having

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Leopard's Champing At 64-Bit

BY ALEX HANDY

SAN FRANCISCO — Complete 64-bit compatibility and a new version of its Xcode development tools are among changes planned for Mac OS X 10.5—code-named Leopard—that Apple announced at its Worldwide Developers Conference here in early August.

Apple also announced that by October, all of its Macintosh computers would be running on

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Sun Reveals Details of Open-Source Java

Most of ME available this year, SE open by 2007, both under OSI-approved license

BY ALEX HANDY

SAN FRANCISCO — Sun Microsystems announced at the LinuxWorld Conference here in mid-August that it will open the source code for most of the Java Micro Edition platform by the end of this year and that Java Standard Edition would follow soon after.

Alan Brenner, Sun's vice president of mobile and embedded, said at a press conference that with the entire Java ME team working exclusively on transitioning the language's code to open source, all but parts of the CDC stack will be ready this year. "There are pieces of the upper stack on the CDC side that probably won't be finished," stated Brenner.

Brenner gave few details about Sun's plans for a Java ME development community, however, mentioning only in his closing remarks that he hopes the open-source community will bring more diversity to the platform.

"There are a variety of hardware architectures and operating systems that we would like to see filled out and supported in our implementation. We're [also] hoping to attract the attention of the hardware vendors," said Brenner.

Developers can provide input and track progress of Sun's efforts at community.java.net/jdk/opensource.

Adam Jollans, open-source strategy manager for worldwide marketing strategy for the IBM software group, asserted that the community is the most important part of open-sourcing Java. "It isn't just about publishing source code. It's about how you build a vibrant community that will take it forward," said Jollans. "This is something we learned a lot about with Eclipse. That's the sort of model that has to be set up. If there's one company dominating it, then you won't get the same type of community."

> *'We're hoping to attract the attention of the hardware vendors.'*
>
> *—Alan Brenner, Sun's vice president of mobile and embedded*

According to Brenner, Sun also will continue to offer a commercial version of Java ME. "So we'll also be looking at improving the usability of the code," he said. "[Sun is] very much focused on making it easy to use our software and being an implementation specialist around that open-source codebase." Brenner was unable to point at a specific license under which Java ME would be released, but said it would be one of those approved by the Open Source Initiative (OSI).

Laurie Tolsen, vice president of developer products and programs at Sun, said, "Our primary focus is keeping compatibility." Tolsen said that she expects the open-source community will also enforce compatibility standards on the code they contribute, since the primary benefit of Java is reliable compatibility.

Ari Jaaksi, open software platform director for Nokia, said that he hopes the move to open source will end the fragmentation that currently plagues the platform. Jaaksi also said that his company has been in discussions with Sun about the move to an open-source Java, but he declined to comment further on the discussions.

OPEN STANDARD EDITION

Sun said source code for some parts of the Standard Edition will be available this year, also under an OSI-approved license, and that by early next year the majority will be open, distributed in a buildable form.

Tolsen said it is likely that Sun will release the Javac Java compiler and the Hotspot Virtual Machine this year.

One of the main concerns for the move into open source, said Tolsen, is the design of the development community. She said that setting up proper facilities for contributors and the actual construction of such a system is proving to be a great deal of work.

Tolsen also hinted at a possible realignment of Java SE and EE (Enterprise Edition). "We are also looking at reapportioning the Java brand. People have come to rely on the Java brand write once, run anywhere. The community will enforce that. They can't afford to have noncompatible forms," said Tolsen. ■

Linux Hits Phones, Desktops

LinuxWorld Conference demonstrates readiness of OS

BY ALEX HANDY

SAN FRANCISCO — The message at this summer's LinuxWorld Conference held here in mid-August was that the Penguin's operating system is finally ready for prime time use by everyday people and in everyday devices.

Mixed in among the many enterprise-centric exhibits were newcomers to the show, such as **Motorola** and **Canonical**, creator of Ubuntu Linux. Motorola showed off its new RAZR and other Linux-based mobile phones, and said it will offer them in the United States likely by early next year. Canonical was demonstrating the ease and versatility of its version of the operating system, as was **Novell**, now a regular fixture at LinuxWorld. Both offer distributions specifically targeted at desktop PCs.

Trolltech's Greenphone is part of a Linux-based development environment for mobile apps.

Novell showed SUSE 10—now called openSUSE—featuring Xen virtualization, Xgl graphical bells and whistles, and a slick desktop that rivals the Mac OS for animation. Also announced at the show was a new partnership with Lenovo to offer Thinkpads with SUSE Linux preinstalled.

New faces at LinuxWorld also included folks from **PalmSource**—now a subsidiary of **Access**—which released its libsqlfs library under the LGPL. Part of the Access Linux Platform (ALP), the library provides an easy way to add an OMA Device Management-compliant read-write system to the SQLite package. The library is available now at www.palmsource.com/opensource/downloads.html. The company also launched a developer network to help build out the environment of mobile Linux applications for ALP.

SD Times SHOW REPORT

Trolltech announced the availability of the Greenphone, a Linux-based development platform. Greenphone is a GSM/GPRS phone that's built to be flashed and reflashed with prototype applications.

Elsewhere on the show floor, **rPath** announced the availability of rBuilder 2.0. The tool automates much of the work associated with building a software appliance by handling the configuration of an underlying Linux install on which the core application can run. New to version 2.0 are enhanced remote updating capabilities that simplify deployment of new code, and facilities for the creation of demos and trial versions of an appliance, which can be burned onto a live bootable CD or DVD.

Members of the **Linux Test Project** were on hand to show off their massive database of test cases. The draw for Linux-based QA teams is the massive number of predesigned tests that can be had through the project. Michael Reed, staff software engineer at IBM, and the lead maintainer of the Linux Test Project, said that the project has garnered more than 2,900 separate tests, ranging from kernel-targeted suites to tests designed to poke databases.

LINUX DRIVER DEBATE PAGE 15

Intellectual property protection software company **Palamida** announced IP Authorizer 1.0. The tool helps development teams deal with licensing issues surrounding third-party code that they integrate into their applications. The tool offers a central system and method of communication for internal enterprise discussions regarding third-party code. IP Authorizer brings the lawyers, managers and developers into a single process of approval.

ANTs Software announced version 3.6 of its database management software. The ANTs Data Server 3.6 adds support for 64-bit Windows and Linux implementations as well as compatibility and performance enhancements.

EnterpriseDB announced the immediate availability of the EnterpriseDB Replication

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News Briefs

COMPANIES

Microsoft has confirmed reports that it will not continue development of its Virtual PC for Mac technology, acquired from Connectix in early 2003, on the grounds that porting Virtual PC to Intel effectively meant starting from scratch in what is suddenly a competitive market . . . **CA** and **Meta Integration Technology** have agreed to embed Meta's Model Bridge (MIMB) into CA's AllFusion Erwin Data Modeler with the goal of improving designer productivity by automating the job of integration, speeding up response time to changing business requirements. MIMB assists organizations in getting the most out of data modeling by helping to implement metadata management strategies, according to the companies . . . **Fortify Software** and **Watchfire** have agreed to integrate their application vulnerability solutions. Fortify's Source Code Analysis Suite helps find the exact spot in code where vulnerabilities exist, and Watchfire's AppScan looks for such weaknesses as cross-site scripting and buffer overflows in production-ready applications. Together, the companies claim, the integrated solutions provide security coverage throughout the software development life cycle.

NEW PRODUCTS

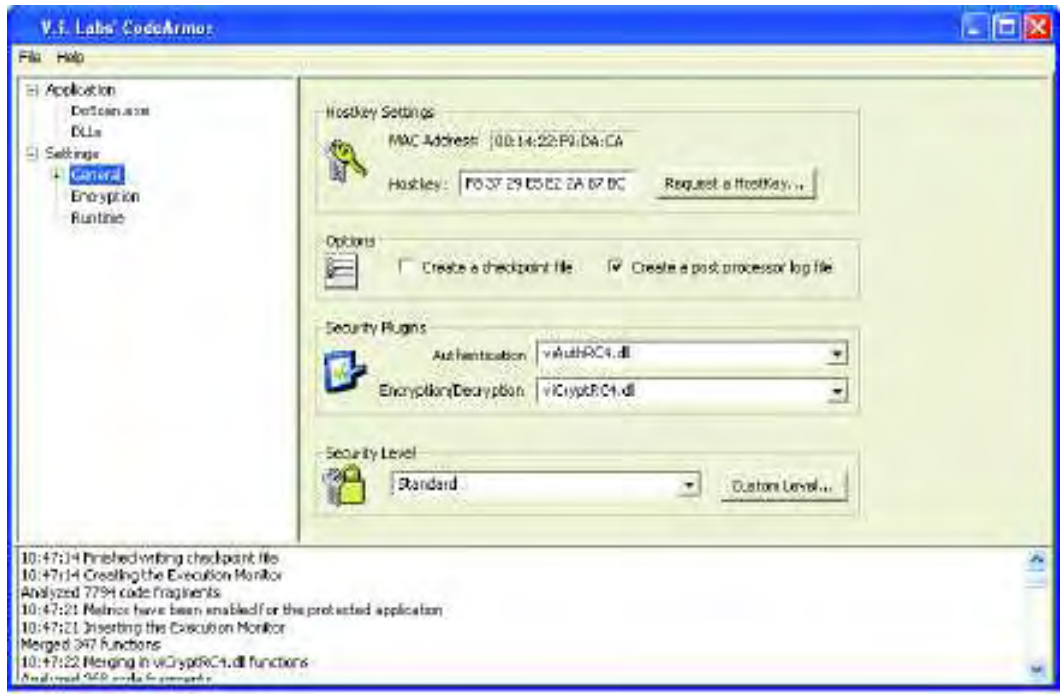
The SCO Group is shipping its **EdgeBuilder** mobile application development toolkit as a plug-in for Microsoft's Visual Studio 2005 development environment. SCO is looking to provide ease of use for Microsoft developers who want to create and deploy rich mobile applications and services on SCO's **EdgeClick** mobile development platform. SCO also announced it has joined the Visual Studio partner program, which will enable it to redistribute Visual Studio 2005 with the integrated products . . . VistaDB has released a preview of its fully managed SQL database engine for Microsoft's .NET and Compact Frameworks, Windows Vista and Mono. The company claims that for the first time, developers can build fully managed WinForms and ASP.NET database applications for desktops, mobile devices and Web servers using **VistaDB 3** . . . VMware has announced plans for a version of **VMware for Mac OS X** that will support virtual machines of *x*86 operating systems, including Linux, NetWare and Solaris, as well as Windows. A beta will be available later this year.

UPGRADES

Orinda, Calif.-based IC Soft has released **icTracker 7.2**, an update to its project management and bug-tracking software with the capability of making tasks recur daily, weekly, monthly or yearly. The new feature eliminates the need to continually update a project with recurring tasks by allowing managers to set up the tasks at the beginning of a project . . . SoftBrands has released version 8.4 of its **Fourth Shift Edition** ERP system for SAP Business One, which adds support for Business One 2005 SP1 and multiple databases. It also adds modularized language features aimed at customers that want to support multiple languages without installing multiple software versions . . . Parallels has released a beta version of the first update to its namesake **Parallels Desktop for Mac**, and announced that it expects to ship the update shortly. The update offers improved support for USB, better performance for graphics and shared folders, and selective hard disk caching. It also addresses shortcomings in keyboard support.

PEOPLE

The Agile Alliance, a nonprofit group that promotes the concepts of agile software development, has named seven new board members: **Jennitta Andrea**, ClearStream consultant; **Todd Little**, senior development manager for Landmark Graphics; **Ryan Martens**, founder and CTO of Rally Software; **Elizabeth Hendrickson**, president of Quality Tree Software; **Mike Griffiths**, senior technical director at Quadrus; **Willen Van den Ende**, Living Software consultant; and **Mary Lynn Manns**, a professor at the University of North Carolina-Asheville. The alliance's new chair is **Rachel Davies**, founder of Agile Experience. ▮



CodeArmor lets users create encryptions and decryptions to verify that functions have not been tampered with.

Vi Labs Protects Apps With CodeArmor

BY ALEX HANDY

Encrypting the internals of an application and attaching a small debugger that always runs inside of the program are two methods used by Vi Labs' new CodeArmor application protection software to stem the tide of trojan horses and hacker invasions. While the company will be releasing version 2.0 of this tool in mid-September, it has already tested these capabilities behind closed doors with a limited release of version 1.0.

The company's new security product automatically protects any compiled Windows binary from decompilation, malware injection and piracy. The tool automatically adds these protections to finished applications without the need for source code or recompilation.

Victor DeMarines, director of product management for Vi Labs, said that CodeArmor can be set to automatically protect functions within an application, or it can add encryption and protections to specific functions, such as license checks or the code that commits changes to a database. DeMarines also said that CodeArmor's agent is injected into the application and requires no outside frameworks or runtimes to work.

Once injected, CodeArmor checks and verifies that functions have not been modified by checking predetermined validation sums that it keeps inside the application for verification purposes.

In addition, the CodeArmor agent associates itself with the application's functions as a debugger, thus preventing other debuggers from being run within Windows to check the code. This works because Windows allows only a single debugger to be running against an application at a time.

THE ENCRYPT KEEPER

The encrypted sections of the program, added DeMarines, are decrypted on-the-fly, compared for validity, then re-encrypted and hidden once they're no longer in use. These encrypted sections of the program are determined by the developer, and can be limited to singular functions, or can be used on the entire program.

"At runtime after [CodeArmor] decrypts the function, we are verifying that function has not been tampered with. If someone was smart enough to inject their code or take advantage of a buffer overflow, we detect that, and do not allow it to run, and then we try to self-heal," said DeMarines. "We have the original function residing in the secure execution monitor."

Version 2.0 of CodeArmor will feature a more heavily protected agent that will help to prevent the actual CodeArmor protections from being circumvented by hackers.

The new version will also feature more easily automated protection injections. Currently, the tool offers simple automated protections based on the size of a function. Version 2.0 will offer additional methods of automatically adding function protection, though DeMarines could not elaborate on these at press time.

While he did admit that his company's tool adds some latency and size to an application, DeMarines insisted that the slowdowns never reach past about 5 percent of normal speeds.

CodeArmor currently runs only in Win32; future versions will add support for Unix applications. Enterprise pricing is US$18,000 per application, while ISV pricing is based on the price of the application being sold with protection integrated.

While purchase of CodeArmor does include 24x7 tech support, DeMarines said that it's rarely used by customers beyond the initial install period. "Once the organization evaluates and applies it to their product and does testing, we normally don't see any other issues after they start distributing and releasing the product," said DeMarines. ▮

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With New Intel Tool, Parallelism Is Elementary

Threading Building Blocks for C++ simplifies design of multicore applications

BY EDWARD J. CORREIA

Adding parallelism to C++ applications can be reduced to child's play, according to Intel, which on Aug. 28 introduced Threading Building Blocks, a library that it says simplifies the job of leveraging multiple cores in 32- and 64-bit architectures.

Earlier in the month, the company updated its Thread Checker and Thread Profiler Windows tools for the new library and introduced Thread Checker for Linux, claiming an industry first.

According to James Reinders, director of Intel software products, Threading Building Blocks offers an easy way to create applications that take advantage of multicore processors. "The most common way to express parallelism in a program is to create threads and assign work to each thread," he said, adding that multiprocessor APIs such as OpenMP permit such techniques as directing a "for-loop" to run in parallel. "But that's pretty limiting. Often you want to express more parallelism than that."

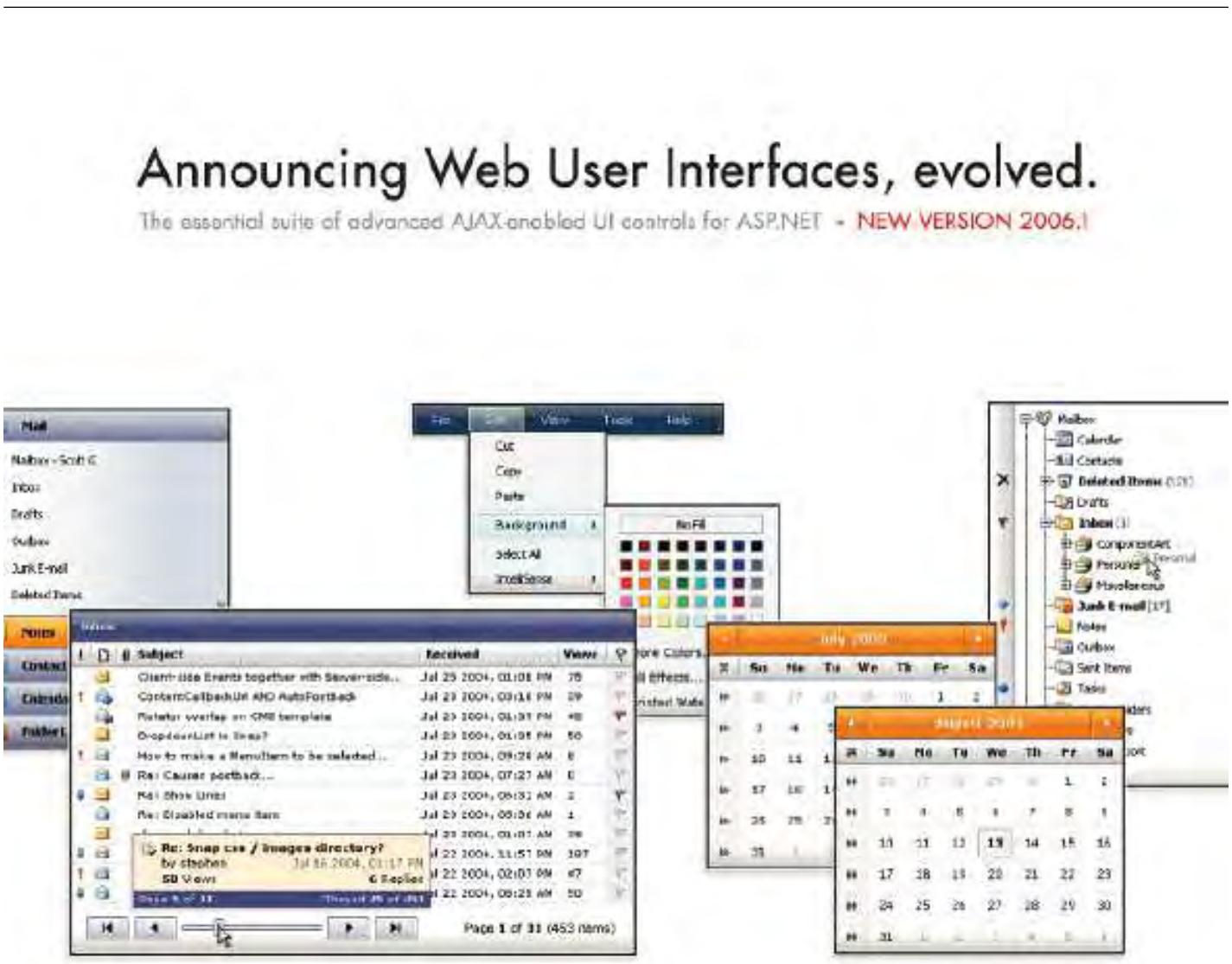
Managing such threads, he continued, can be extremely code-intensive. "It's easy to write threaded code for a few threads," he said, but to scale much beyond that requires a thread queue. "And that queue can get bottlenecked pretty quickly. All you really want is an algorithm that works in parallel with thread-safe data structures so it will run not just on two processors but on four or eight."

Reinders claimed that the US$299 Threading Building Blocks library works with most C++ compilers, including those from Apple, Microsoft and GNU and, of course, Intel's own. "The template library gets linked in with template definitions and header files. It's not a radical departure from the way people program."

To add parallelism to existing apps, developers will want to focus on finding areas where their program spends the most time, Reinders said, or let a tool such as Intel's VTune do the work. "You could use VTune to find a for-loop and change it to run our parallel for-loop or do things that work well with our pipeline directive." After those small code modifications, he said, "you should see results pretty quickly."

Developers will have an even easier time, he claimed, if their applications already use POSIX or OpenMP APIs. "The building blocks work well in those environments. And you won't have to rewrite the entire program."

Threading Building Blocks was scheduled to be available now for 32-bit *x*86 processors, including Intel's Core 2 Duo, Xeon and Pentium processors running Linux, Mac OS X and Windows; for Intel-64 versions of the same processors running Linux and Windows; and for Itanium 2 (IA-64) running Linux.■



Fiorano to Host a Component Gallery

Borrowing from iTunes, company tries to ease the job of assembling apps

BY DAVID RUBINSTEIN

Envisioning a development experience along the lines of Apple's popular iTunes music store, Fiorano later this month plans to open a component gallery to speed the delivery of applications in a world of distributed computing.

With iTunes, explained Fiorano's CEO and CTO, Atul Saini, "you can pick off six songs and make an album. Our vision is for you to go to a gallery, and pick off three or four components—all will have XML interfaces—and voilà, you've got your app."

Saini said that an order-processing engine, or a service to return values of stock, for example, would be the types of components or services that a developer could find in the gallery. "These are at a higher level than a [Visual Basic] component," Saini noted.

Fiorano will host the component gallery "initially," Saini said, without revealing anything more about hosting. It will be available for use on Sept. 15 in the recently released update to Fiorano SOA 2006, the company's services integration platform. In that release, native support for .NET was added, improving the Visual Studio integration and making a multiplatform, multilanguage environment available to that pool of developers. The platform now natively supports Java, C, C++ and all the languages associated with the .NET platform, including C# and Visual Basic.

"In .NET, the tools are cooler, but there's not quite the stability of a Solaris," Saini said. "People want to develop in .NET and deploy in Linux."

Fiorano will create the initial group of components, and rely on contributors for others, whom Saini said could set their own pricing for their components. The XML interface allows for simple integration of the components, which can be written in whatever language the contributor prefers.

"XML is expressive enough, and it's easy to specify," Saini said. Java EE Connector Architecture (JCA) and Java Message Service (JMS) interfaces also will be supported, although Saini pointed out that with Java, there are memory issues when a large number of components are deployed. "C++ is the preferred development language if you want a fast server," he said.

Saini also said that the C/C++ runtime in its Enterprise Service Bus has been tuned for better performance, and the C/C++ libraries for messaging have added functionality for high availability and clustering, as well as tuned algorithms focusing on flow control.

The one drawback, according to Saini, is putting a neat label on all the new capabilities. "You could have a C# binding to a JCA interface in a C++ runtime on a Java server," he said. "What do you call it?" ▮

Galaxy Studio Revolves Around Runtime Revolution

BY P.J. CONNOLLY

Fans of the Runtime Revolution rapid application development environment are seeing a new series of scripting tools from Daniels & Mara, an Austin, Texas-based consultant that boasts "an elite band of experienced, agile Revolution programmers."

The company develops Galaxy, a series of products that replace the Revolution cross-platform IDE for Mac OS X and Windows.

Galaxy Studio, released in mid-August, starts with the Galaxy family's simplified user interface and tabbed script editor, and adds succeeding layers of functionality, one upon the other.

Galaxy Studio is built around the company's lowest-end for-charge product, Galaxy Lite, and adds a dictionary engine that runs faster than the one found in the native Revolution tools, a Project Manager that offers a hierarchical view of the "stacks" into which Revolution applications and datasets are organized, and a "message box" that includes a navigable command history. Galaxy Studio also provides a new component framework that allows other makers of Revolution development tools to hook into Galaxy.

Daniels & Mara CEO and founder Jerry Daniels explained why some of the new tools focused on autocompletion to the degree they did. "One of the things every environment tries to get toward is…to have as much error-free scripting as possible." A feature with a common aim, named "ScriptPaint," came from a customer request for GUI-based text insertion. "You point the cursor over a word," Daniels explained, "hit a hot key, and it will get inserted" at the insertion point. Controls and other objects can be treated in a like fashion; one points at it, and with a click, inserts its name in the code.

THE NEW 'SWITCHEROO'

Another touch Daniels expects developers to appreciate is the "Switcheroo" routine, which allows developers to look at code and attributes in the same window, switching back and forth with minimal changes to the UI.

Although the company's current Studio, Lite and Free packages are aimed at hobbyist and solo developers, the company has plans to release Galaxy in Enterprise and Professional editions, which will incorporate collaboration options, external framework support and formal project management features.

Daniels & Mara will license the high-end editions on a subscription basis, at US$24 per month and $16 per month, respectively. Galaxy Studio costs $96. All Galaxy versions run on Mac OS X and Windows XP and require Revolution version 2.7 components, as well as a license for Revolution Enterprise or Revolution Studio.

Daniels expects that Galaxy Professional will ship toward year's end, with Galaxy Enterprise following in the first quarter, depending on forthcoming releases of Runtime Revolution. ▮

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Sybase Announces Data Integration Suite

Acquisitions and internal technology drive federation, replication, search tools

BY P.J. CONNOLLY

Aspiring to help customers make sense of disparate databases, Sybase has announced plans to release the Sybase Data Integration Suite later this year. In its first iteration, the suite will include tools for data federation, real-time event notification, replication and search, supported by metadata management and modeling tools built around Sybase PowerDesigner and the Eclipse-based Sybase WorkSpace IDE.

The suite "covers and spans the range of different styles of data integration," according to Kathleen Schaub, Sybase's vice president of information technology solutions. "We're putting these together in one package and binding them up with common development tools, common administration, common modeling and metadata, so that customers can not only do individual projects, but they can accretively build more sophisticated applications."

The new suite is a combination of new technologies from recent acquisitions as well as internal developments, which, according to Schaub, offer superior economy and flexibility compared with existing point solutions or hand-coded attempts.

Schaub noted that a new generation of applications has much broader data requirements. Whereas applications traditionally have been closely linked to data in almost a one-to-one relationship, "people going into the SOA world need to think about data in a whole different way" she said.

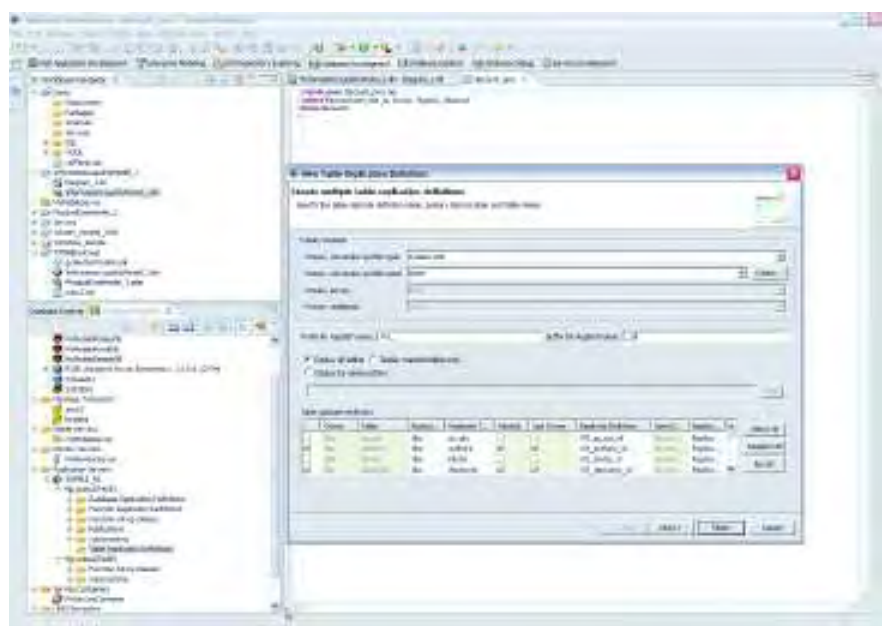
The data replication tools have their roots in Sybase's Replication Server, and provide access to datasets from across the enterprise.

Meanwhile, a homegrown polling application is the foundation for Sybase Real Time Events, which connects enterprise databases to messaging buses, such as those from TIBCO or IBM's WebSphere MQ (formerly MQ Series). By the company's telling, Real Time Events minimizes the lags in data that are inherent in the use of intermittent polling and batch processing.

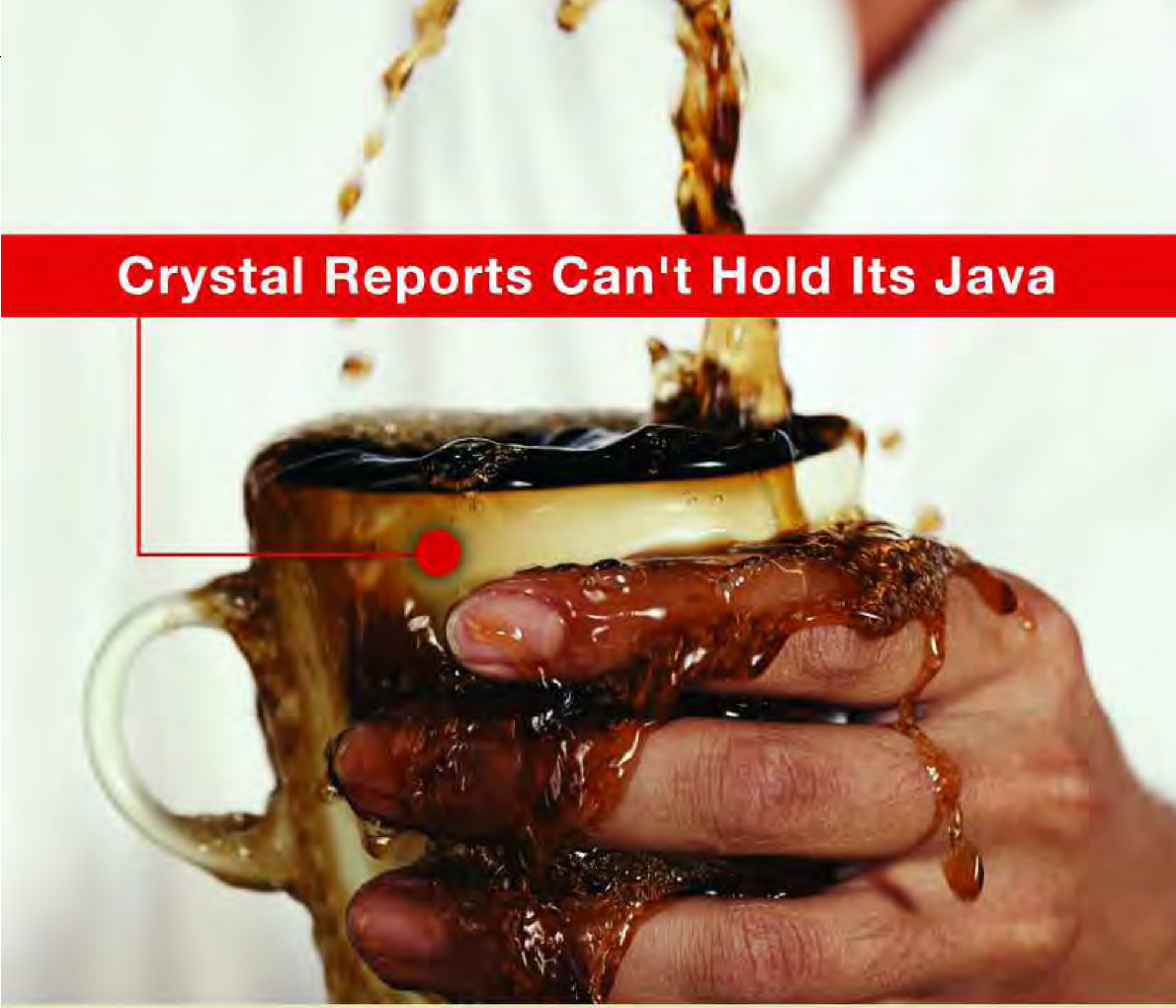
Last year's purchase of Avaki provided Sybase with the bits behind Sybase Data Federation, which the company positions as a way to integrate data from multiple sources and present the aggregate in a consistent, standardized fashion.

Sybase Search—based on the OmniQ technology acquired in the 2005 purchase of ISDD—allows companies to design applications that trawl through a variety of static and mobile data stores, whether they be centralized repositories, document management systems or even an old-fashioned file system tree.

Finally, the June takeover of Solonde gave Sybase a leg up in the development of a fifth product, Sybase ETL, which the company plans to integrate into future versions of the Data Integration Suite, although for now, it's sold by itself. ▮



Sybase WorkSpace provides access to features of the Data Integration Suite; data replication features are shown here.



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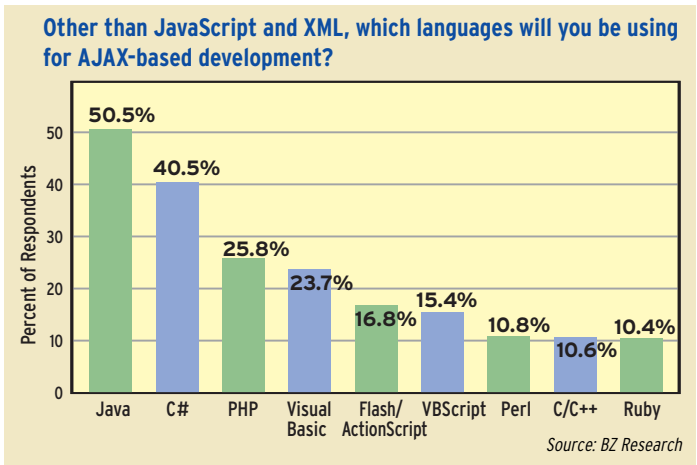
Almost a Clean Sweep: About 3 in 4 Use AJAX

BY ALAN ZEICHICK

Nearly three out of four software development managers say that they're using or planning to use AJAX-based rich Internet application technologies. That's according to an independent July 2006 study conducted by BZ Research.

BZ Research is a division of BZ Media, publisher of SD Times. The study was of 578 subscribers to SD Times, and has an accuracy of 3 percentage points.

In this study, 18.9 percent of respondents said that their companies have already deployed production systems using Asynchronous JavaScript and XML. Another 12.0 percent said that they are developing their first production systems but haven't deployed yet, and 14.2 percent are developing pilot systems. In addition, 37.7 percent are studying the technology. Only 9.5 percent said that neither they nor their company has plans to use AJAX; 7.6 percent said that they didn't know.



Why are development managers interested in AJAX, and in related RIA and so-called "Web 2.0" technologies? The responses varied, but many cited the improved user interface experience due to AJAX's elimination of postbacks.

"We are looking into using the technology for a Windows-like interface to our embedded system," said Wendi Whitcomb, a senior systems engineer at ZoZo Engineering, while Jeffrey Price, president of Price Performance, explained, "Customers demand desktop application look and feel. Citrix/Terminal server approach [is] becoming cost prohibitive due to licensing costs." Scott Finnerty, technical director of Barkley Evergreen & Partners Interactive, said, "We've embraced Rich Internet Application development as being key to the future of user experience for our clients."

Other reasons had to do with the back end of an AJAX deployment. David Yutzy, manager of Web applications at Retail Ventures Services, explained that AJAX can "reduce bandwidth requirements, increase utilization of servers, [and] enhance experience to users." Similarly, "AJAX allows us to reduce network load and server utilization to allow servers to handle more load and be more responsive," said Blaine McDonnell, senior analyst at AT&T Services.

That's not to say that everyone is an unabashed fan of AJAX. "Personally, I feel that it's overblown in popularity and not all that useful in all applications," said one respondent, who wished not to be identified.

Security seems to be a common concern, with AJAX being "too much exposed for the client side: Some delegated checking should be double-checked in server, since in the client side it seems to be exposed to crack it," said Paulo Soares, general manager of Central Call.

Another respondent, Philip Christensen, managing director of Formation Design Systems, added, "Tools are too immature at the moment for full commercial deployment. [It's a] promising technology, [and it] remains to be seen how standardized the environment will be and consequently how low cost deployment can be."

Interestingly, development is evenly split when it comes to platforms for deploying AJAX-based server applications, with 52.1 percent saying they'll use Java or J2EE, and 51.9 percent saying Microsoft's ASP.NET or Atlas—a statistical tie. An additional 19.7 percent are using or considering Macromedia Flash, 9.8 percent Ruby on Rails, and 5.5 percent ColdFusion.

"The real value of AJAX will come from tools that reduce the complexity and cost of implementing an enhanced user interface in the web browser environment," concluded Joel Simpson, director of software development and integration at Codesic Consulting. "The highly user-focused perspective taken in the design of AJAX applications results in functionality that rivals functionality found in some of the best desktop applications available today." ■

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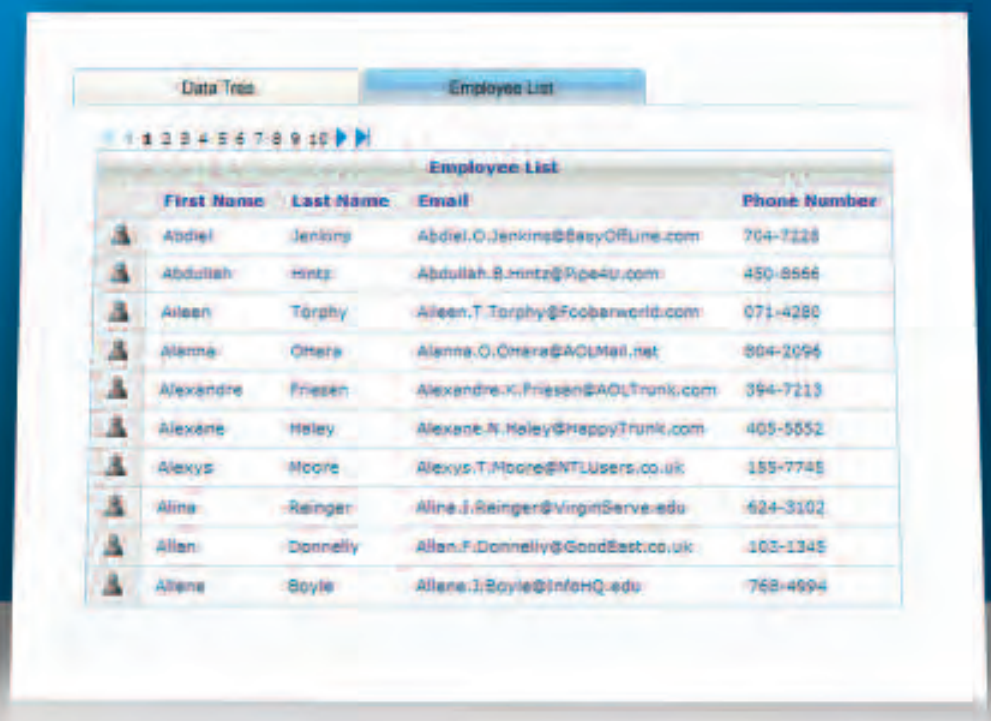

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6th Sense: Productivity Is More Than a Hunch

BY P.J. CONNOLLY

Can a manager be an impediment to developer efficiency? According to 6th Sense Analytics, the answer can sometimes be yes.

The company in August took the wraps off its namesake development analysis software as a service, which it says is intended to give managers accurate metrics to help keep developers productive. The service will become generally available in September.

6th Sense CTO and cofounder Todd Olson said the company's methodology isn't about counting lines of code or clocking people in and out of projects, but rather about capturing development intangibles, such as finding a developer's groove of peak performance, what the company calls "flow time."

Olson noted that most developer tracking relies upon people manually inputting data, which, he argued, fails to give the best available picture of the development process.

The tool is free for individual users; managers and team leaders who want access to the aggregated data have to pay US$80 per user per month. Data can be benchmarked within a shop, or it can be assessed against the results of other organizations using the software. As of mid-August, 126 developers at 30 customer sites were already using the service.

6TH SENSORS

The 6th Sense architecture starts at the developer workstation, with the installation of one or more sensors that hook into the developer's preferred IDE. Sensors are currently available for Borland's JBuilder, Eclipse, Emacs, Microsoft's Visual Studio .NET 2003 and VIM. Sensors for Visual Studio 2005 and JetBrains' IntelliJ IDEA are under development.

The sensors collect activity data—whether the activity is a file editing session, a code review, a check-in, design time or something else—and send it over a secure connection to the 6th Sense Analytics aggregation server. The activity data is then chunked into five-minute blocks to determine the predominant activity during that period, which 6th Sense refers to as "active time."

Managers analyzing active time can look at developers in terms of projects, technology, and of course, activity type. The objective in this scheme is to maximize "flow time," when productivity and quality are at their highest. 6th Sense claims from its observations that this usually amounts to half the total active time expended.

So, if developers are at their most productive about half the time, what's a manager to do?

The answer may not always be obvious; one anecdote related by 6th Sense CEO and cofounder Greg Burnell concerned a client who noticed productivity was up during his absence.

"We debunked the concept that when the manager's out of town, nobody works." He continued by noting that the person in question is now "more aware of the disruptions that he imparts on his development team," ultimately making him a better manager. ▮

Novell's Closed-Source Driver Policy Stirs Debate

Linux vendors wrestle with issue of including proprietary code in distributions

BY P.J. CONNOLLY

On the heels of the July release of desktop and server versions of SUSE Linux Enterprise 10, Novell further tweaked its Linux lineup last month by renaming its SUSE Linux 10.1 distribution to "openSUSE," and aligning the company's free-for-download offering with the Novell-sponsored openSUSE project. The SUSE 10 series showcases Novell's new hands-off approach to proprietary drivers.

Novell's driver policy, announced in March, means that selecting features requiring a closed-source driver invokes a download from the vendor, instead of Novell. Novell has pledged to work with affected vendors to ensure that, for example, SUSE's kernel changes don't break video drivers and vice versa, according to Novell's Linux product management vice president, Holger Dyroff.

A 'PRACTICAL SOLUTION'

Dyroff explained that the company's approach was an attempt to create a practical solution to the problem of supplying proprietary code while maintaining a commitment to open source. He claimed that closed-source drivers are not popular in the Linux community and noted that there may be legal issues, referring to possible conflicts with the GPL. Beyond the ideology, and more important to his business, is the problem of supporting other vendors' closed systems.

Other vendors maintain a similar stance, offering a distribution containing purely open-source software, and so-called "commercial" versions that include various degrees of closed, proprietary components. Perhaps the most extreme example of this is Linspire, whose CEO Kevin Carmony argued that the issue is end-user convenience. Carmony claimed that one of the most valuable things a Linux vendor can do is to run interference on behalf of customers with vendors that don't offer open-source software, to take care of licensing and support issues.

Mandriva CEO Francois Bancilhon agreed with the proposition that the issue is one of ideology versus practicality. He asserted that Mandriva's Dynamic Kernel Module Support (DKMS) offers his customers a middle path between open- and closed-source drivers by insulating the kernel from device drivers.

Red Hat was unable to provide a spokesperson; Canonical, owner of Ubuntu, did not respond to a request for comment.

Forrester Research senior analyst Michael Goulde believes that vendors who aren't offering open-source components and drivers are missing a golden opportunity.

Vendors should direct open-source efforts instead of fighting them, he said. "Why not co-opt the efforts and maintain your leadership position?" ▮

Wily Extends Introscope to Detect Changes

New agent software can determine if application performance is adversely impacted

BY DAVID RUBINSTEIN

Wily Technology is giving its Introscope performance monitoring agents the ability to detect changes to production applications in real time, claiming to help organizations better diagnose the reasons for application failure.

Introscope ChangeDetector, announced in mid-August, can determine if an application failure is change-related, according to Ju-Kay Kwek, product manager at Wily, a division of Long Island-based computer giant CA. Kwek claimed the tool is the first to tie change data to performance, to help administrators understand if the change is the cause of the problem.

With Introscope, for example, users can be alerted if log-in performance goes above three seconds, Kwek explained. The ChangeDetector extension now lets organizations know that a change to the log-in servlet was made just prior to the performance decrease, he said.

A dashboard helps users organize change monitoring by time and number, by application or for each individual component, or it can give a list of all changes, he said.

The new tool, he explained, looks at changes to binaries, configuration files, database tables and JVM class loading. "Customers care about business apps," he said. "They don't care about router changes, unless they negatively impact the applications and business transactions," Kwek said.

When a failure occurs, ChangeDetector can be used to first verify if any changes that were made were authorized and approved, he said.

Kwek said the speed with which change occurs in Web applications, as businesses try to keep pace with competitors and take advantage of new opportunities, highlighted the need for this kind of tool. "There are system variables in a JVM, where a typo can change 5.2MB to 52MB" and seriously impact performance, he said. "Then you have DBAs nuking indexes, and that can ground an application to a halt."

Among the things ChangeDetector does not do, Kwek explained, is deal with governance. The tool will spot a change but won't indicate if the change violates any internal company policy or industry or governmental regulation. Nor can it be used to initiate a change, such as a scheduler in a change management system might be used.

Wily intends to come out with a similar tool for use in mainframes within the next six to 12 months, Kwek said. Wily continues to operate as a standalone business unit within CA, which announced its acquisition in January 2006. ChangeDetector, despite being a new tool, carries a 7.0 version number, to align it with the latest release of Introscope. ▮

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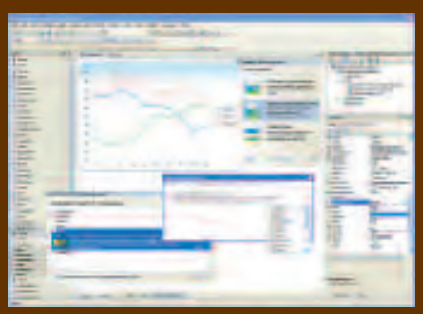

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U.S. Leadership on Cybersecurity 'AWOL'

◂ continued from page 1

government respond to that."

Asked whether DHS plans to appoint an acting assistant secretary for cybersecurity and telecommunications, DHS spokesman John Papa said: "The department continues to pursue qualified candidates." Of the task force report, Papa said, "The department welcomed those recommendations and took them into consideration within the larger context of the Software Assurance Program's priorities and goals."

The Software Assurance Program's aim is to reduce software vulnerabilities, minimize exploitation and address ways to improve the routine development and deployment of trustworthy software, according to Papa.

'RUNNING IN PLACE'

But Paul Kurtz, executive director of the Arlington, Va.-based advocacy group Cyber Security Industry Alliance, said DHS has not taken adequate measures to address cybersecurity concerns. "Cybersecurity is [apparently] not an issue for DHS," he said in a phone interview with SD Times. "[The cybersecurity division] is running in place." He echoed that message in a July 13 news conference on Capitol Hill, where he joined Patrick Leahy of Vermont and other Senate Democrats in calling for stronger cybersupport leadership from DHS.

"The U.S. government leadership on cybersecurity is AWOL," Kurtz said in his public remarks. In September 2003, following the launch earlier that year of President George W. Bush's National Strategy to Secure Cyberspace initiative, DHS tapped Symantec executive Amit Yoran to head its cybersecurity division. But Yoran resigned from his position after only a year, departing just before original DHS head Tom Ridge stepped down in late 2004.

"Homeland Security has had growing pains," acknowledged Moritz.

In a phone interview with SD Times, Yoran declined to say why he left DHS. But a report published in the Washington Post on Oct. 2, 2004, noted that Yoran had been disappointed that he was not given as much authority as he was promised to attack the problem.

Yoran told SD Times that under his tenure, the cybersecurity division made some significant strides, such as getting the FBI, IRS and State Department to share with DHS ongoing data about cyberincidents. While many such efforts have had no immediate impact, "there is great long-term potential," he said.

Chief among the cyberincidents gaining attention are those that put consumer data, such as credit-card numbers, at risk. "It is becoming an all-too familiar story in the lives of Americans: the escalating reports of the unauthorized disclosure or theft of sensitive, personal information," said Leahy in the July 13 news conference, referring to well-publicized incidents in both the private and public sectors.

Cybersecurity does not appear to be an issue for DHS, says Cyber Security Industry Alliance's Kurtz.

'NO ONE IN CHARGE'

In July 2005, director of Homeland Security Michael Chertoff took steps to broaden the authority of the department's cybersecurity chief. His announcement that the department had created the position of assistant secretary for cybersecurity and telecommunications essentially elevated to a higher level the position Yoran left vacant.

But one year later that position remains vacant.

While DHS "works steadfastly to find a nominee for the assistant secretary for cybersecurity position," it has begun to take measures to address data security issues, DHS' Papa noted.

For instance, the National Cyber Security Division of DHS sponsors "Build Security In," a Web portal (www.buildsecurityin.us-cert.gov) launched in October 2005 that provides guidance to the software developer community. In the near future, DHS will sponsor publications such as the Software Assurance Common Body of Knowledge and Security in the Software Lifecycle, the official said.

It's appropriate for DHS to take a stance on secure coding practices, but its key role must be to "protect from attack the information infrastructure that we use every day," said Kurtz. "The private sector is far better suited to address secure software development practices."

That effort is well under way, added Moritz. "Making sure code is secure—that is already happening among development managers," he said. "That was a good outcome of our task force." ▮

RECOMMENDATIONS FOR DEVELOPING SECURE SOFTWARE

In April 2004, the Improving Security Across the Software Development Lifecycle task force, formed in 2003 as part of President George W. Bush's National Strategy to Secure Cyberspace, submitted a set of recommendations to the National Cyber Security Division of the Department of Homeland Security. According to task force co-chair Ron Moritz, chief security officer for CA, DHS thanked the task force for its efforts. But more than two years later, it has yet to issue a formal response.

Here's a brief look at some the recommendations included in 123-page report.

Enhance the education and training of present and future developers. Specific educational recommendations include: Make security a core component of software development programs at the university level, and develop and publish Internet content pertaining to secure software development.

Develop and apply processes and practices to improve the quality and security of software. The task force suggested that DHS enlist the support of groups such as the United States Computer Emergency Readiness Team (US-CERT) and the Information Technology—Information Sharing and Analysis Center (IT-ISAC) to work with software producers to determine the effectiveness of practices that reduce software security vulnerabilities.

Develop incentives that create a culture of security awareness. Recommendations include: Make the security of a developer's code a job performance factor, create industry awards that recognize secure development practices, and develop a multicompany program that offers rewards for information leading to the conviction of cybercriminals.

—Jennifer deJong

Source: www.cyberpartnership.org/SDLCFULL.pdf

States Rule in Raising Secure Coding Awareness

BY JENNIFER DEJONG

As the U.S. Department of Homeland Security struggles to take a formal stance on cybersecurity issues, state laws that mandate breach notification are taking the lead in showing business leaders why secure coding practices matter.

The laws were enacted to protect consumers from security breaches such as the February 2005 incident at Atlanta-based data broker ChoicePoint, where hackers stole personal data on more than 150,000 consumers.

California led the way with its Security Breach Notification Act, which took effect in July 2003. The law mandates that consumers must be notified when their name is illegitimately obtained from a server or database, along with personal information such as their Social Security number, driver's license number, account number, credit- or debit-card number, or security code or password for accessing their financial account, according to San Diego-based consumer advocacy group Privacy Rights Clearing House.

CEOs need to pay attention to software security, says CA's Moritz.

Since then, more than 30 states have passed comparable laws requiring that individuals be notified of security breaches, according to the advocacy group.

The issue of writing secure software is becoming much more prevalent, said Ron Moritz, chief security officer at Islandia, N.Y.-based software company CA. "I can't say every CEO is thinking about application security. But we have seen the consequences of CEOs not paying attention."

Breach notification laws have helped underscore the importance of secure application development, said David Grant, vice president of marketing for Waltham, Mass.-based Watchfire, which sells application security software. "But they don't solve the problem." They don't require companies to implement strong security throughout the application life cycle, he said.

To date, neither the Senate nor the House of Representatives has passed any law about data breaches and security, noted Grant. Several federal bills, including the Data Accountability and Trust Act, are pending. If passed, the law will require any entity that experiences a breach of security to notify those in the United States whose information was acquired by an unauthorized person. The bill is currently awaiting a House vote.

Federal laws governing breach notification are not necessarily the answer, said Grant. They run the risk of becoming too "watered down by lobbyists," he said. "They shouldn't preempt the state laws, which are giving us good notification." ▮

_INFRASTRUCTURE LOG

_DAY 15: This project is out of control. The development team's trying to write apps supporting a service oriented architecture...but it's taking FOREVER!

_DAY 16: Gil has resorted to giving the team coffee IVs. Now they're on java while using JAVA. Oh, the irony.

_DAY 18: I've found a better way: IBM Rational. It's a modular software development platform based on Eclipse that helps the team model, assemble, deploy and manage SOA projects. The whole process is simpler, faster and all our apps are flexible and reusable. :)

_The team says it's nice to taste coffee again, but drinking it is soco inefficient!

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Sun Considering Baking AJAX Into Next JSF Spec

◂ continued from page 1

what he called an explosion of end points on the server. "For each piece of AJAX goodness you're using, you might have a separate JSP you're talking to, and each of those widgets might have a different kind of end point. If you work through a mediator, you can control those endpoints," with JSF acting as the perfect mediator, he said.

Burns said he also believes that because JSF development is already understood by many enterprise Java development shops, having JSF tools that automatically generate AJAX is easier than building the JavaScript code by hand.

Burns also pointed out that JSF has its own validators and type conversion capabilities built in, which would otherwise need to be coded by hand in JavaScript.

That's one of the reasons Exadel created AJAX4JSF, its open-source JSF component system. "The components will render all the necessary JavaScript, XML, CSS and HTML to provide the functionality," said Fima Katz, CEO of Exadel. The tool is now available on Java.net, and is designed to work alongside other JSF and AJAX components with little or no modification.

'AJAX PUSH'

IceSoft, on the other hand, created IceFaces to accomplish the same tasks. CTO Steve Maryka said that IceFaces offers some functionality that's not available in other JSF/AJAX frameworks. "One of our key differentiators is a capability we call AJAX push, the ability to dynamically update the presentation from some server-initiated event as opposed to a user event," he said, adding that the typical event model requires the user to interact first. Using IceFaces, a Web-based e-mail client could automatically show new e-mails as they arrive, he said, rather than the current model that relies on timed or user-requested refreshes.

Such functionality may soon become a standard feature of JSF 2.0, said Burns. "People have realized that if you have segmentation of different AJAX solutions, it's not operating as efficiently as [it] could if there was a standard. Let's make the [technology] a commodity and have the implementations be where the value is," said Burns.

IceFaces, for example, renders all of its AJAX directly to DOM, a method that is not widely used by other JSF-to-AJAX frameworks, and as such, offers limited compatibility with other JSF components.

Burns finished his work as specification lead on JSF 1.2 in May but is already considering what will be included in version 2.0. He said that both Exadel and IceSoft have expressed interest in participating in the effort—whenever that might be—despite the fact that some of the functionality both companies point out as their differentiators may soon become part of the specification. ▮

Making AJAX a commodity will put the value into the implementations, says Sun's Burns.

MICROSOFT OFFERS FREE XBOX GAME DEV SUITE

BY ALEX HANDY

Microsoft announced in mid-August that it would offer a coding suite to Xbox 360 owners, the first console video game development suite to be offered for free to end users. The company also plans to begin a service that will enable developers to share their games online via the Xbox Live online game service.

The free tools, dubbed the XNA Game Studio Express development suite, were scheduled to be released in late August. However, developers wishing to test their games on an actual Xbox 360 must pay US$99 per year to subscribe to the XNA users group. The suite runs under Windows XP. ▮

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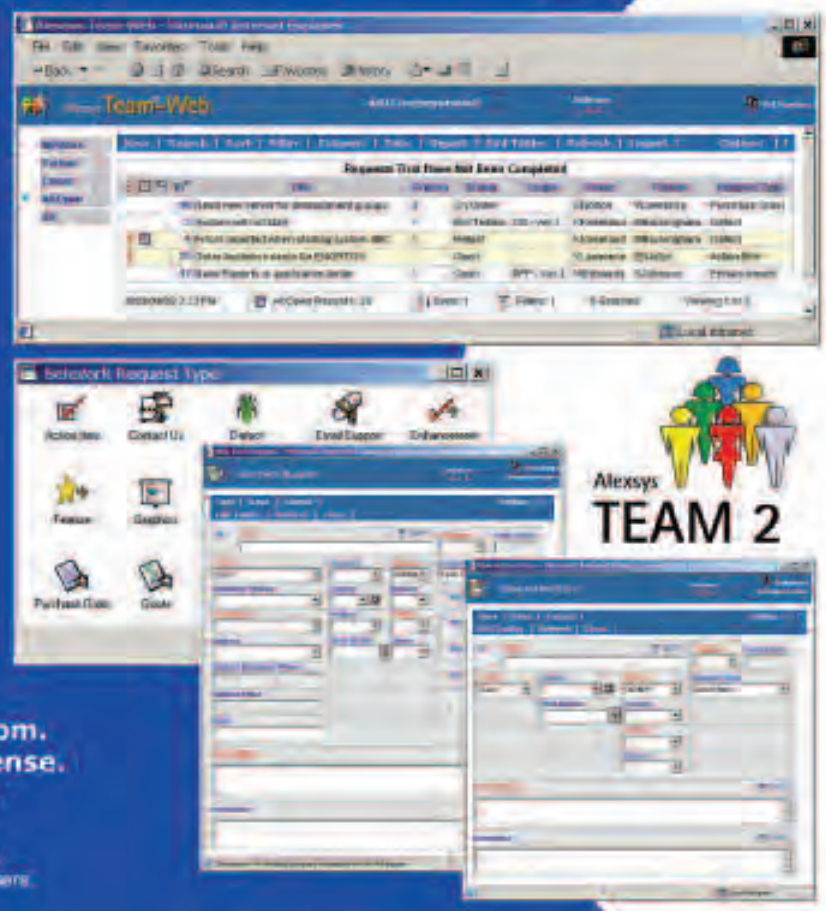

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Team 2 works with its own standard database, while Team Pro works with Microsoft SQL, MySQL, and Oracle Servers.
All versions of Team 2 work on Windows 95/98/Me and Windows NT/2000/XP/2003, Netscape and Microsoft Internet browsers.

Lattix Releases LDM for .NET, Eyes Oracle Support

Lower-cost versions target smaller projects; database dependencies are next

BY P.J. CONNOLLY

Lattix announced last month the general availability of a module for its LDM dependency modeling software aimed at .NET developers, and new Professional and Professional Plus editions of LDM priced for solo developers and smaller projects.

The new LDM editions cost US$495 for the Professional and $695 for the Professional Plus, and have the same modeling features as the $2,295 Enterprise edition but are limited to 500 and 1,000 files or classes per model, respectively.

The new LDM module joins the company's dependency trackers for C/C++ and Java. "In the .NET world, there isn't anything that enables you to extract dependencies, analyze them and formalize the architecture," said Lattix sales vice president Frank Waldman. LDM "is the first tool that will allow people who are building these complex .NET applications" to do that, he claimed.

According to Waldman, the impetus to move ahead with an LDM for .NET came from the customers of LDM for C/C++, released earlier this year. Noting that the LDM line supports legacy as well as new code, he cited the advantages of "an analysis that will cover both the original codebase and the migration to .NET."

Waldman also confirmed that Lattix was looking to extend its dependency management lineup to embrace databases, beginning with an evaluation-only LDM for Oracle. He could not say when it would be generally available. ▮

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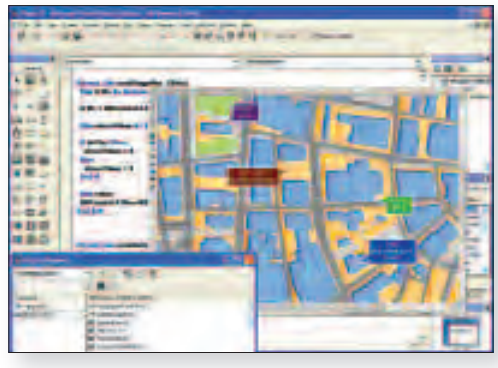

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Pragmatic Planning Tool Gets Boost

BY DAVID RUBINSTEIN

Pragmatic Software late last month released an update to its Web-based Software Planner software with advanced project management, project security and team collaboration features.

"We do everything from requirements gathering, test-case management, defect management and project management as well," said Steve Miller, Pragmatic's CEO. "There are linkages to all these areas in a single tool."

Software Planner 7.8 allows managers to create project plans and to control access to those plans, then to track variances as the projects move along to see if those changes from the plan were authorized, according to Miller.

Team members update the status of their tasks through the Web-based interface; their time entry helps organizations manage time sheets and billing. ▮

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Attack Detection as Important as Prevention

New PreEmptive tools will signal unexpected application, user behavior

BY DAVID RUBINSTEIN

It's one thing to be able to prevent attacks on applications. It's quite another to be able to detect when an application is being attacked.

That's the problem PreEmptive Solutions is looking to solve with the staggered release later this year and early next of its "SOS" family of tamper detection tools.

"The smarter developers get at detecting buffer overflows and other attacks, the less they know about the hostility of the environment," said PreEmptive senior vice president Sebastian Holst. "For instance, if an application automatically rejects a bad user name, there's no way to know if it was an honest mistake or an attack. The fact that someone tried [an attack] and failed is important information."

The upcoming releases will add to PreEmptive's preventative code obfuscation controls by enabling developers to set usage thresholds for their applications that when exceeded will trigger signals back to a managed service.

First up is SOSignal, targeted for release in November. The tool will signal when application transactions have unexpected endings or usage levels spike. In early 2007 will come SOSecure, which will include an attack profile taxonomy of such attacks as SQL injections and buffer overflows. SOSmart will follow later in 2007, Holst said. The tool addresses the business performance side. Organizations, he said, "will be able to see if someone is changing something internally. It focuses on the community, and can give the application's perspective on the community's performance."

Dashboards will bring together data on such things as application adoption, user efficiency and operational risk—how the apps are being used, Holst explained. "You will get a true perspective of use beyond the silos of information." ■

LinuxWorld Showcases OS

◂ continued from page 3

Server, which can replicate data from one Oracle or PostgreSQL database to another in near real time. The company also released EnterpriseDB Advanced Server 8.1 Release 2, now with the ability to automatically migrate from Oracle to EnterpriseDB, and a handful of new tools for building software that relies on an EnterpriseDB database.

Symantec was also on hand to trumpet the recently released Veritas Storage Foundation 5.0 and Veritas Server Foundation 5.0. These tools are designed to ease administration of Linux-based systems in the data center. In addition, Symantec announced partnerships with Red Hat and IBM to bring virtualization into its data center products. ■

Leopard's Champing at 64-Bit

◂ continued from page 1

Intel processors, marking the end of the Power Mac era.

In his keynote address, Apple CEO Steve Jobs demonstrated new features in Leopard for the gathered throng of faithful developers. According to Jobs, more than 4,200 developers were in attendance, the largest-ever turnout for the event.

He also announced Xcode 3.0, an upgrade of Apple's integrated development environment for building Macintosh apps in C, C++, Objective-C and Java, but would not explain which new features would be included.

FEATURES TAKE SPOTLIGHT

The real stars of the show were the 10 Leopard features discussed during the keynote, including the addition of support for the building and running of 64-bit applications in Cocoa and Carbon, Apple's two Mac OS X-specific programming environments, on Intel processors.

Currently, Apple's operating system supports 64-bit applications only on Power PC G5 processors. Apple insists that 64-bit applications written for Leopard will run on both 64-bit and 32-bit processors, no matter the environment, without modification or emulation.

The initial Intel-based Macintoshes used the 32-bit Intel Core processors. However, some newer models, such as the recently announced Mac Pro workstation, will use Intel's higher-end Xeon processor, which supports both 32-bit or 64-bit operating systems. Jobs also announced that in October, the company will ship Xeon-based servers.

At the show, Apple announced the launch of www.macosforge, the company's new open-source repository for internal projects. But without fanfare, Apple made available on the site the source code for Mac OS X Intel kernel versions 10.4.7 and earlier. In addition, the site hosts a new open-source calendaring server and the source code to the company's Bonjour networking protocol.

Also announced during the keynote was a new suite of tools for building Dashboard widgets. Apple offered up a simple way for users to turn sections of any Web page into a widget, a process that was demonstrated by Scott Forstall, Apple's vice president of platform experience. Forstall went on to state that Mac OS X 10.5 would include JavaScript editing and debugging tools for more advanced widget creation, though he did not elaborate on whether these tools could be used alongside other development applications.

Another feature discussed by Jobs and Forstall was a new animation API called Core Animation. This set of libraries will make it easier for developers to add flair and movement to their applications. Other features shown included a new backup system called Time Machine, a redesigned mail client, improved support for handicapped users, and multiple virtual desktops.

The final new feature discussed was an improved iChat messaging client that will add on-the-fly background changing and improved video conferencing. Users will be able to show photos, presentations and movies via iChat messaging.

Jobs said Apple expects to ship Leopard by spring 2007.

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Awaiting a Tools Buyer, Borland Brings Back Turbo Brand

◂ continued from page 1

on developers," said Borland vice president of developer relations David Intersimone.

The developer focus is key to attracting a buyer for Borland's IDE business, which in addition to the Delphi, C++ and C# tools, includes the company's Java development environment JBuilder. Intersimone said Borland is on schedule to announce a buyer in the third quarter of this year. "We have been assured [of that time frame]," he said.

In February, Borland announced plans to divest itself of the IDE business and focus solely on its application life-cycle management offering, Core SDP, which combines tools for IT governance, modeling, requirements, coding, change management and testing.

Borland has said earlier that some assets of JBuilder may make their way into future releases of Core SDP, and that the issue is likely to be addressed through a cross-licensing agreement with the buyer.

Asked whether issues surrounding the cross-licensing of JBuilder for use in Core SDP have been a sticking point in negotiations with potential buyers, Intersimone said they had not. "But we will have customers in common," he said referring to the yet-to-be-named company that will sell the developer tools, and Borland.

As reported earlier by SD Times, Borland has continued to enhance JBuilder as it awaits a buyer. JBuilder 2007, built on Eclipse instead of the company's earlier proprietary framework PrimeTime, is expected by the end of this year.

TURBO EDITIONS

Borland will offer each of the new Turbo releases in two editions: Explorer, a free download (available Sept. 1 at www.turboexplorer.com), and Professional, which Borland expects to price at less than US$500 per developer, Intersimone said. Both editions of the IDEs include more than 200 components, enabling the development of both Windows and Web applications. But the free version prevents developers from plugging in third-party tools, he said. "To do that, you have to upgrade to the Professional edition."

Borland launched Turbo Pascal 1.0 in 1983, the same year the company was founded.

The Delphi predecessor included not just the Pascal programming language, but also an editor, debugger, compiler and other tools, and is widely considered to be the industry's first IDE.

Borland went on to launch IDEs for Basic, Prolog, C and C++ under the Turbo brand and did not retire the Turbo name until 1995, Intersimone said. "The brand is a classic."

Even before it announced plans earlier this year to sell its IDE business, Borland drew criticism that it had abandoned its roots as a company that makes tools for developers. "But the new company will have a complete focus on developers," said Intersimone. ▮

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Build Management Adoption of Maven

Open-source tool sees more rapid uptake

BY ALEX HANDY

After four and a half years in development, Maven is seeing significant uptake for the first time. With around 20 percent of Java developers surveyed stating that they use Maven, according to O'Reilly Media, this open-source build management system has moved from being a slowly developed project to one of the most active pieces of software at the Apache Software Foundation.

In the 2006 O'Reilly survey, 90 percent of respondents said they currently use Ant, while close to 20 percent reported using Maven. These were two of the most popular non-IDE tools used by Java developers, with JUnit and XDoclet being the only other tools with significant penetration.

Jason van Zyl, creator of the Maven project and co-founder of Mergere, a company he founded with Winston Damerillo to offer service and support contracts to Maven users, said that he and his partners were moved to create and refine Maven because of the complexity of Ant, the first Apache build effort.

"Ant is a great toolbox," said van Zyl, "but what Maven provides is some structure and process. We take the idea of providing a good toolbox, but we also provide patterns that are very akin to design patterns. If [a developer has] used Maven once on a project, it doesn't matter what other Maven project [the developer goes] to. If a developer is working on one open-source project and goes to another, he can familiarize himself quickly with the build, as opposed to reading through a thousand-line Ant script."

Tracy Ragan, co-founder and CEO of Catalyst Systems, agreed that Maven does solve a problem. She said that many organizations have realized that spending hours building a new Ant script for each project is a waste of time. Her company's OpenMake build management tool supports Ant but uses Perl scripts to accomplish some of the things Maven does. OpenMake offers its services to Java, C and C++ users, while Ant and Maven are primarily used with Java. Ragan said that there's a trade-off when using Maven.

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Expert: Soaring by Java developers

'Ant is a great toolbox, but what Maven provides is some structure and process. We take the idea of providing a good toolbox, but we also provide patterns that are very akin to design patterns.'

—Jason van Zyl, Maven creator

"Because Maven is still an Ant XML process, you have to conform to the directory structures required by the design of Maven," said Ragan. "The designers of Maven said, 'This is the best way to lay out an Ant XML build.'"

That means that existing projects already heavily entrenched inside of a Subversion, CVS, Perforce or other repository must undergo a directory normalization prior to moving to Maven. And that, said Ragan, is no small task. But despite the difficulty of redesigning the layout of a project within the repository, Ragan agreed that there was no other way to standardize builds in Maven that wouldn't have required such a choice.

She agreed that Maven was a great step toward removing build complexity, but pointed out that at present, many of the teams her company deals with are still using Ant. Yet, Ragan does admit that roughly 15 percent to 20 percent of her customers are asking about Maven and how it can be supported or replaced with OpenMake. Catalyst does not currently offer Maven support in OpenMake.

But Maven's own repositories are the project's largest benefit for its users, said van Zyl. Maven's maintainers have constructed a set of libraries, .Jar files and other commonly used development tools that Maven can automatically download when needed. This ensures that developers working on a project for the first time won't have to spend their time chasing down dependencies in order to compile a program.

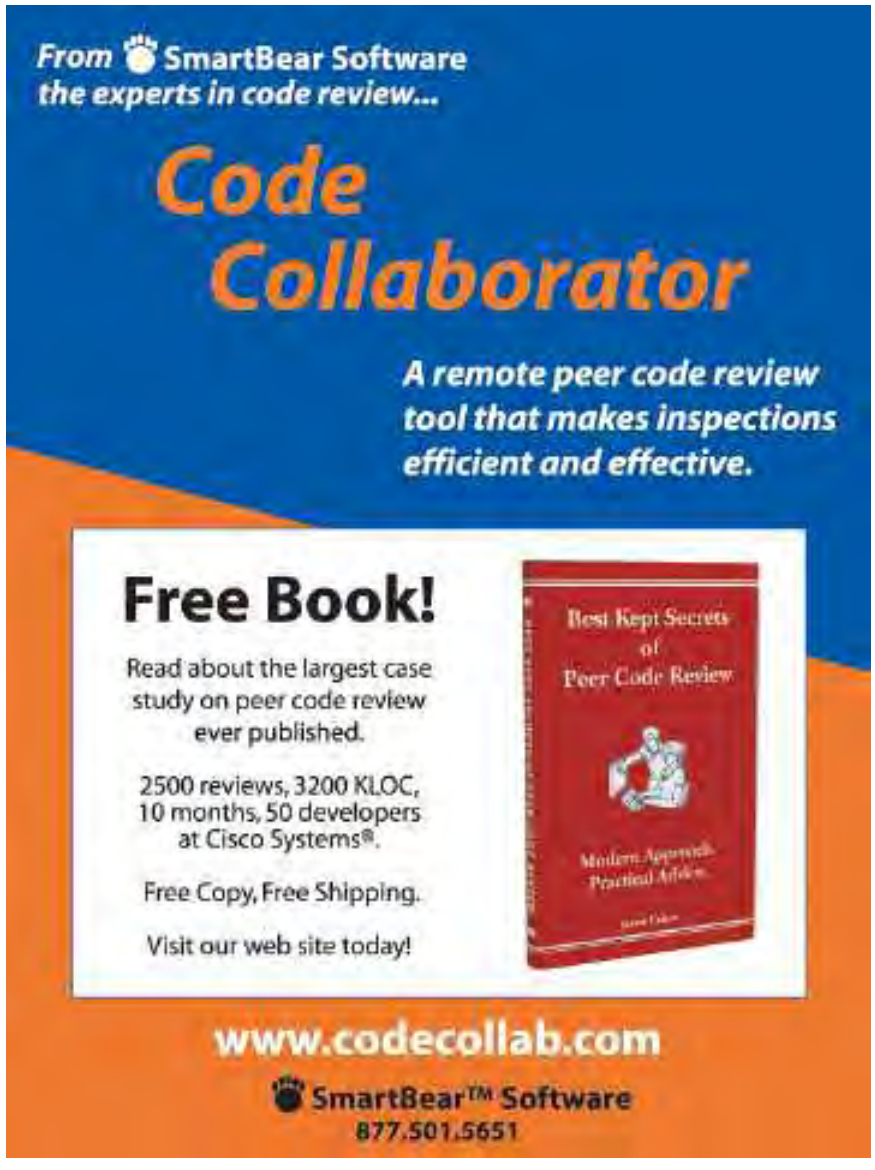
So why is Maven only now seeing rapid uptake? Brett Porter, Mergere's director of engineering, said that Maven's position in the build process is responsible for the tool's sudden growth.

"It would be quite common for an organization to pilot its use on a project or department, and for it to grow from the successes there," said Porter. "One of the advantages of Maven is that because it requires you to create shared build infrastructure, it will often be much less work for subsequent groups in the same organization to adopt it, reusing the work of others."

van Zyl and the Maven team are working on building the beginnings of Maven 2.1. The new version should begin to trickle out in four months, and should include significantly reworked metadata capabilities. At present, said van Zyl, the metadata that Maven encapsulates in each project is not quite descriptive or standard enough for some people using the tool. van Zyl pointed out that the Spring project has moved to Maven, and is currently experiencing trouble with the metadata Maven creates.

For Ragan, the Maven model is a great step into the future, though an unavoidably flawed one. "The problem with the build process in general is that it gets forgotten until later. Developers check files into Subversion, or CVS or Perforce in particular structures, and for them to go back through and restructure all that is fairly time-consuming."

But that, said van Zyl, is the real benefit of Maven: Standardized directory structures mean never being lost in a CVS tree again. ■



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IBM Feeds RFID Developer Needs

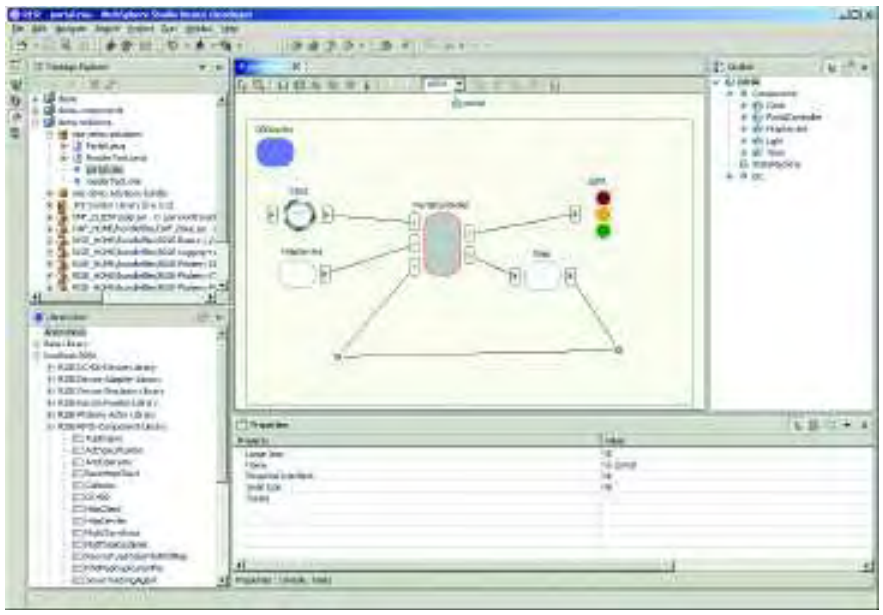
Big Blue posts three free tools, developer resources, on alphaWorks site

BY P.J. CONNOLLY

IBM has posted three new tools and added learning resources to its alphaWorks site for emerging technologies, in an effort to improve supply-chain mechanisms in a way that suits business partners, according to Chris Spencer, emerging technologies strategist for alphaWorks. The new tools and resources, he said, attempt to address the need for instant expertise.

First is the RISE (RFID Integrated Solution Enablement) toolkit, a WebSphere extension developed by IBM researchers in Korea and the United States. It lets developers use prebuilt components to model RFID implementations, test them and then deploy them to specific devices and platforms.

With the RISE toolkit, composition diagrams are used to model data flow, and get switched out as the controller model changes state. The XML-based RISE model format maintains the solution model with component, connection and configuration details. A developer then generates a binary version of the model and feeds it to a RISE runtime environment, which grabs required software bundles from an OSGi service such as IBM's Service Management Framework or ProSyst Software's mBedded Server, and then turns the model over to RISE's execution engine.



RISE allows developers to model RFID implementations by using predefined components (clocks, lights and timers, above), and evaluating against specific behaviors and variables.

The company has also released the RFID Device Development Kit, an OSGi-based infrastructure with tools and access to more than 300 RFID-specific resources, such as articles and tutorials, on IBM's developerWorks Web site.

Part of IBM's Emerging Technologies Toolkit (ETTK) collection, the RFID kit maps API and protocol specifications into XML. Developers can then develop and generate a Java-based device interface, which ultimately becomes a model of the device itself. The device toolkit can also assist developers in creating agent classes that work with IBM's existing middleware for device actuators and sensors. This can be used to create new applications or to extend existing applications with RFID support.

The third giveaway is the Application Level Events (ALE) Preview for RFID, providing browser-based display of RFID events, which the company claims allows developers to add RFID capabilities to applications earlier in the development cycle. Also a member of the ETTK, ALE runs on top of the WebSphere application server and enables a client application to query a network of RFID readers, or other read points, for specific EPC events and data, and supports ad hoc and standing requests. The ALE Preview uses the interface and XML query language from EPCglobal's ALE 1.0 standard, and includes a JavaScript-based client application for creating event cycle specifications and receiving event cycle reports, as well as an RFID trigger simulator.

The tools are available now at www.alphaworks.ibm.com/topics/rfid. ■

SafeNet to Offer Software For Embedded Licensing

BY ALEX HANDY

With companies as large as Cisco Systems advocating the separation of software and hardware for monetization purposes, it's no wonder that SafeNet has decided to release a set of tools designed to manage software licensing on embedded platforms. The company's forthcoming Sentinel RMSe can validate software running on an embedded platform to ensure that it is properly licensed and up to date.

Ken Chow, general manager for the software protection business unit at SafeNet, said the primary motivator for limiting the usability of embedded software through licensing is to keep hardware products fresh and monetized for longer periods of time.

"We provide the vendor a set of APIs and our library. When their OS and the routines embedded within it make a call out to our library, they check first for the presence of a license," said Chow. If that license is not found, the vendor can choose what actions the hardware should take. Possible actions include sending a notification to the user, stopping all functionality or any other tactic that will alert the owner of the need to purchase the proper license.

Chow went on to explain why this functionality is so hard to implement. "The major issue of this in the embedded world is the constrained environments. We've had customers who want our libraries compressed down to 500k, even down to 100k with 30k stacks. Fortunately our product, unlike others, was architected from the beginning to be fairly streamlined," he claimed.

Chow said SafeNet's Sentinel RMSe has allowed its preliminary customers to save money on hardware manufacturing. He said companies can limit the functionality of a piece of hardware with Sentinel, and allow customers to upgrade to a higher-end product by simply purchasing a new license and uploading new software.

Sentinel RMSe works with many embedded platforms, including BSD and MontaVista Software-based systems, and is primarily usable with the C programming language.

The product will be generally available in mid-September, and will cost between US$100,000 and $2.2 million, depending on the revenue generated by the hardware used. Chow said that SafeNet offers 24x7 technical support along with purchased licenses of its software, and that engineering support is also available to customize the product to specific needs. ■

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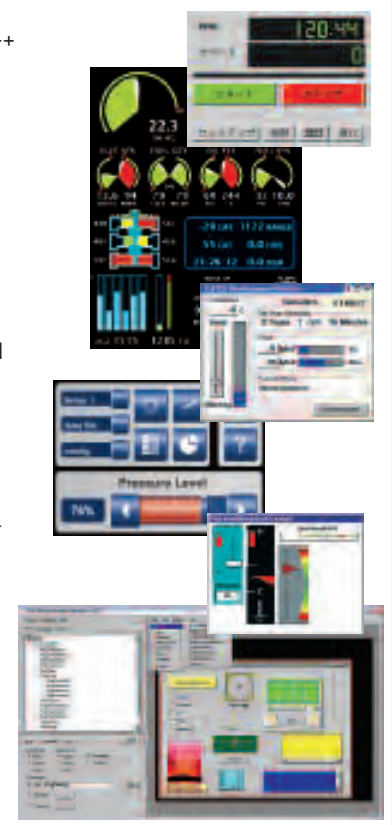

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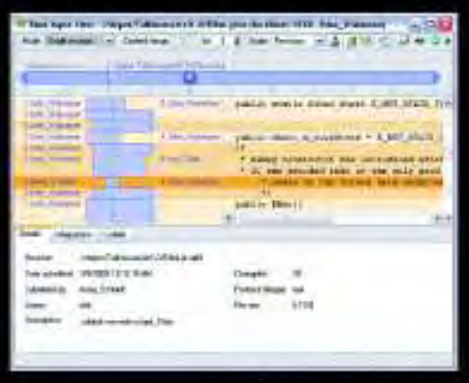

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Get Smart

When knowledge in a particular area is lacking, learn about options for training before signing up

BY GEOFF KOCH

As Alan Koch remembers it, the insurance company was looking for a trainer to help its developer team with three tasks—assess current test procedures, identify industry best practices related to these procedures, and map out a new approach for more consistent and efficient testing.

"It doesn't take much reading between the lines to see what I was told verbally: 'We suck at testing, and we don't know how to fix it,'" said Koch, president of ASK Process, the Daytona Beach, Fla.-based training firm that eventually won the training assignment.

Shoring up a team's software skills requires more than writing a request for information that is a thinly veiled cry for help.

For starters, there's a dense thicket of training options to consider. Nearby expert or nationally known pro? Off-the-shelf or highly customized? Over the Web or face-to-face? Also, many developers and managers weighing these questions only occasionally think seriously about formal instruction.

In short, it's downright tough to be savvy about training, something that everybody agrees is of paramount importance in the hypercompetitive, someone-wants-your-job-in-India-or-China world of software.

Invariably, though, all developers sooner or later will have to peer down the training path. And the best advice for not getting lost, say providers and recent consumers of software training, is to stay alert for a handful of common guideposts.

YOU KNOW YOU NEED HELP WHEN...

The first step—and here it's perhaps appropriate to note that overzealous consumers of drugs, alcohol and technology often are called users—is admitting there is a problem.

Sometimes, the source of the problem is internal. Development processes that work during a sparsely staffed start-up phase can become unwieldy as a company begins to grow.

Koch has trained at least one Washington, D.C.-area technologist struggling to adapt to the new requirement that those bidding on government contracts have a threshold Capability and Maturity Model rating, a standard measure of the ability to produce quality software.

"My experience has been that the motivator for hiring my services is always pain—always," said Koch, also the author of the 2004 book "Agile Software Development: Evaluating the Methods for your Organization."

Angst over particular technologies or processes certainly can snarl the delivery of clean software. However, sometimes a team's problem is more prosaic, such as not agreeing on the meanings of commonly used words in the coding world.

"Vocabulary is important to share between all levels in an organization," said Hubert Smits, a coach at Agile-focused training and tooling vendor Rally Software Development in Boulder, Colo. "'Iteration' should have a single meaning as should 'done' or 'release.' Terms like 'test-driven development' have multiple interpretations, and teams need clarity on which meaning is selected."

Rex Black, a test engineering and automation consultant in Bulverde, Texas, has seen several somewhat dire development problems caused by lack of agreed-upon word definitions and team roles. As examples, he cited two of his clients—a bank in New Zealand and a satellite television company in the United States.

"They both have a 'quality assurance' group, yet 90 percent of these groups' work is testing," said Black, president of Rex Black Consulting Services. "Now, testing software no more 'assures' its quality than getting on a scale assures weight loss."

The bread-and-butter function of testing is to assess rather than guarantee or improve quality, Black continued. So what both of these groups have is a jarring disconnect between what they

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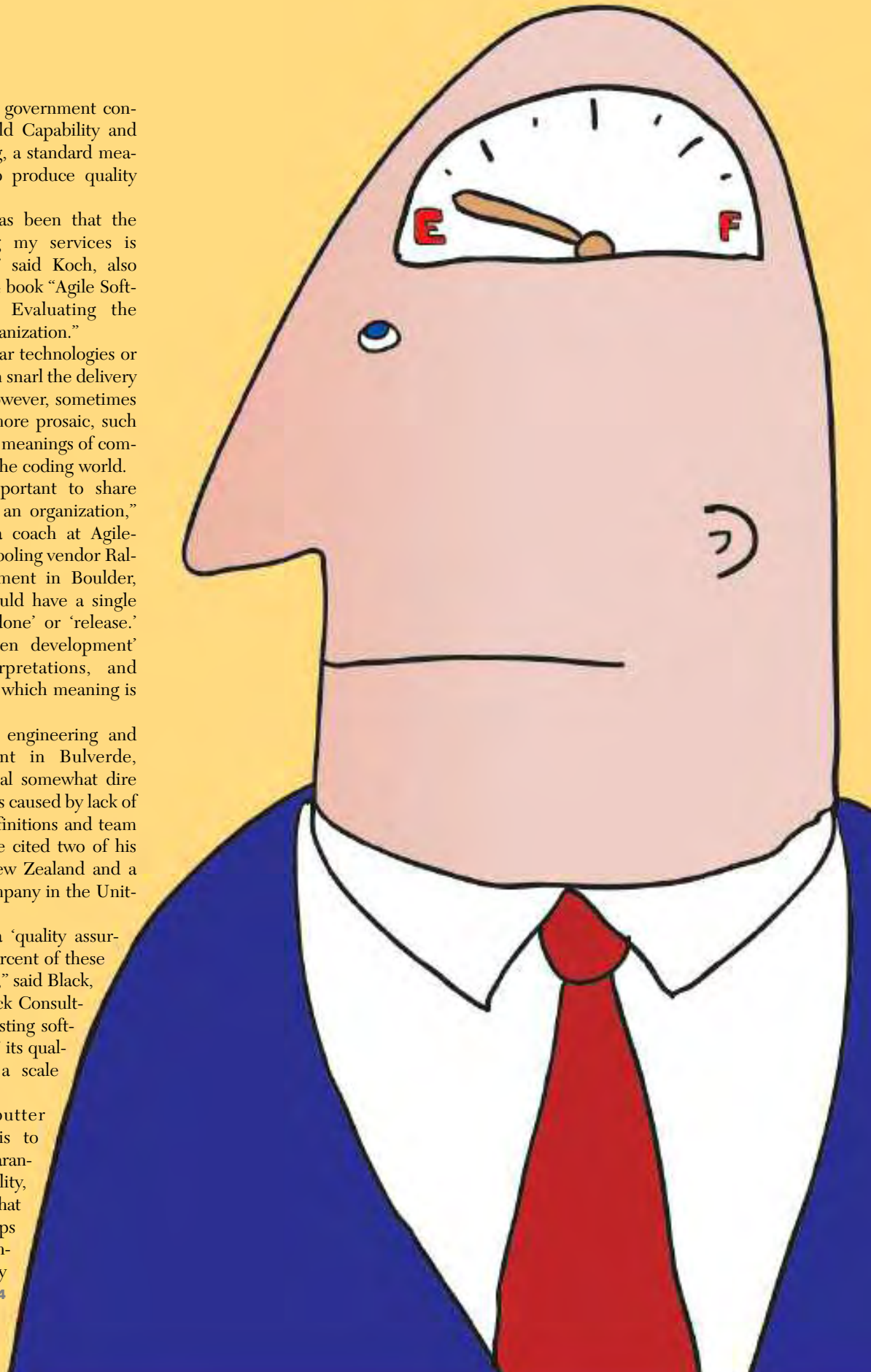


Know Options For Training

◂ continued from page 33

realistically can do and what the organization expects them to do.

Not everyone agrees that it's primarily pain and confusion that pushes programmers into trainers' arms.

"Some organizations, believe it or not, take a more holistic view to training," said Robert Galen, president of RGalen Consulting Group in Cary, N.C. "As part of their annual review and/or budgeting process, they'll analyze where they're going from a technology and project strategy position."

These companies sometimes go on to perform gap analysis and then look for trainers to come in and plug the biggest holes, Galen said.

NOSE AROUND NEWSGROUPS

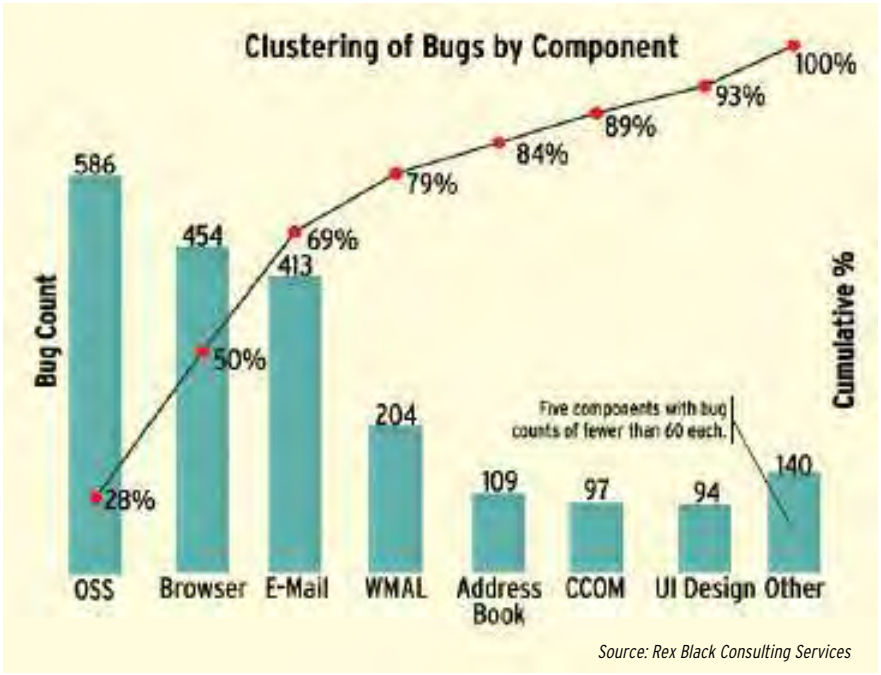
Whether it's pain or proactive investment that's the impetus, once the decision to find a trainer is made, the next challenge is to find a good one.

"Newsgroups are perhaps one of the best ways I can think of to identify appropriate training," said Richard Arneson, a 19-year programming veteran who works in Seattle for Atlas, a division of AQuantive.

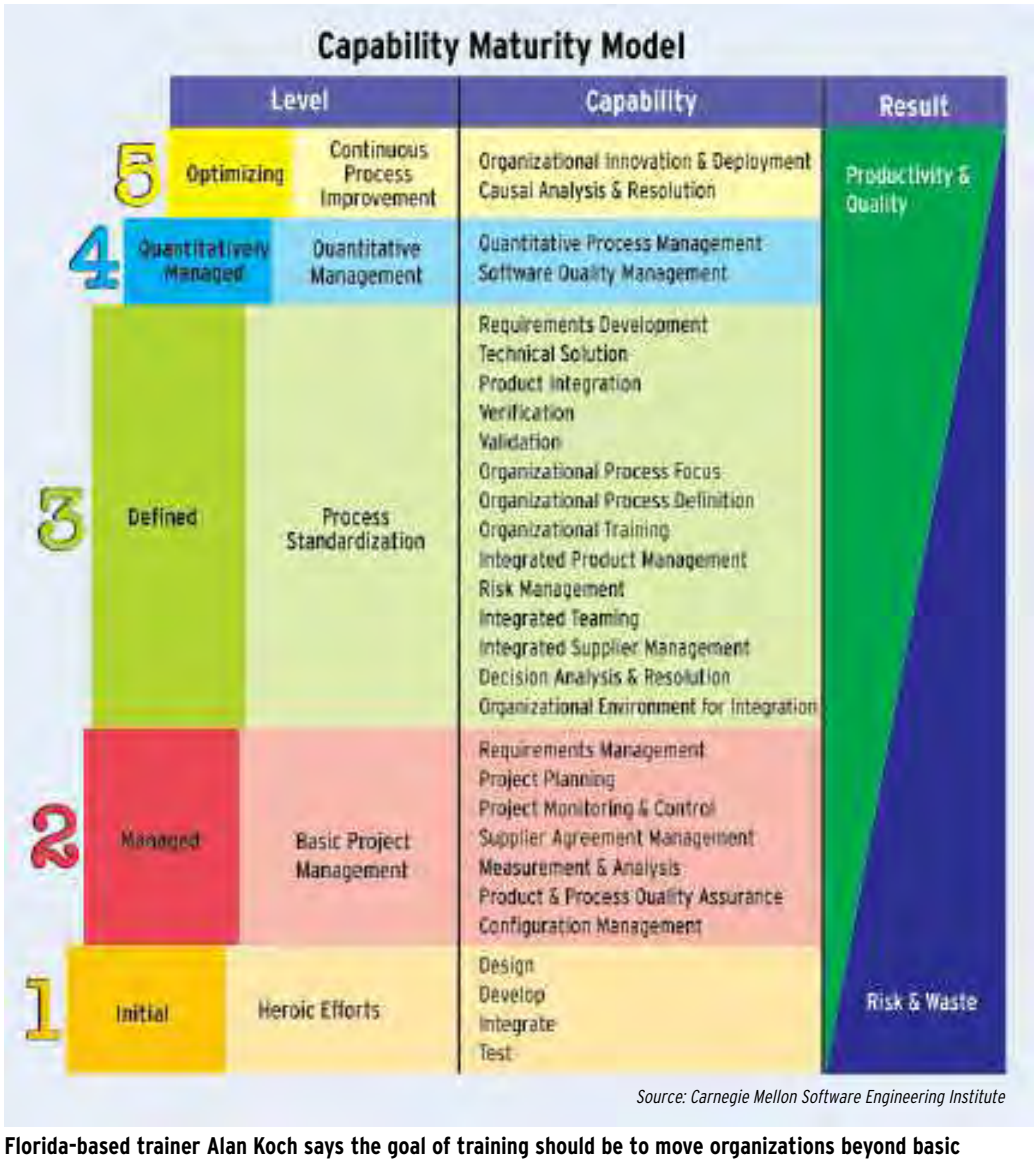
Arneson said his company has been making an effort to make good use of agile development techniques, combining off-the-shelf training with consultants. "Aside from the possibility that you might get reasoned input about what other people have done, the people who do training and consulting seem to haunt the newsgroups. You get a chance to hear their thoughts and see how they interact with the subject."

Rather than trolling newsgroups, Sandra Iniguez's search for training help took a more traditional tack. Namely, she sampled the services of a well-established vendor before jumping in with both feet.

Iniguez, a senior QA manager with HSBC North America in Chicago, found herself with too many employees proficient in basic test execution tasks and too few QA analysts who could actually design a test strategy and develop test cases. When the decision was made to begin sending the basic testing offshore, the challenge was to quickly transform her testers into higher-value QA analysts.



The best training communicates timeless truths about software development projects, says consultant Rex Black. For example, most bugs appear in clusters. This graph shows that more than two-thirds of bugs in an Internet appliance were found in just three of the 12 modules.



Florida-based trainer Alan Koch says the goal of training should be to move organizations beyond basic 'design, develop, integrate, test' routines toward a capacity for continuous process improvement.

Despite the fact that HSBC has its own learning and development department to foster professional development of company employees, Iniguez said there were no internal classes to meet her niche training need. So she did some research on the Internet and found North Carolina-based ASPE Technology, a national provider of systems and software development training that offers courses in the Chicago area.

Iniguez first picked a quality assurance and testing techniques class for three of her employees, all of whom returned with good reviews. Then she accompanied five other staffers to a class on mastering test plan development. After sending other employees to different ASPE courses in Chicago, and comparing notes about what worked and what didn't, Iniguez eventually decided to bring an ASPE instructor on-site for comprehensive training for her entire 16-person team.

For Danny Jones, a Web solutions manager for the Spokane, Wash., Teachers Credit Union, the issue wasn't how to deal with offshoring but rather how to keep an awful development cycle from ever happening again.

"After a 15-month waterfall project finally ended during the summer of 2005, our development team was exhausted and suffering from burnout," said Jones.

Googling for waterfall alternatives, Jones began reading up on agile processes. He wound up spending lots of time on Rally's Web site and eventually set up a few Rally Web seminars to learn more.

"We liked what we heard and saw, although everyone in the room would giggle like little kids whenever the term 'ScrumMaster' was mentioned," said Jones. "It was all new to us."

What followed was a contract with Rally, which sent a consultant to Spokane to help the credit union implement agile practices. Now, when Jones hires new people, he often sends them to Rally's Colorado headquarters for ScrumMaster training before they can join his developer team.

DEVILISH DETAILS

Between the Web and word-of-mouth references, it's actually not difficult to identify a short list of potential training resources. The harder part is agreeing on nitty-gritty details such as class delivery method, content and format.

In 2004, 28 percent of training was delivered via learning technologies such as the Web, according to the most recent State of the Industry Report from the American Society for Training & Development. And e-learning continues making advances; in 2003, learning technologies accounted for 24 percent of the training pie, according to the same report.

However, few providers or consumers of training are worried that the face-to-face market will evaporate anytime soon.

"There is just no substitute for seeing people's faces as you lecture," said Koch. "When you are doing it over the Web, you are literally blind—you have no idea if the students are getting the point, or if you are losing them."

Other limitations to online instruction include reduced interaction, limited opportunity for group exercises and the

▸ continued on page 36

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Get Smart About Training Options

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invariable technical glitches and snafus that detract from the learning environment.

Whether Web- or classroom-based, the course content is undeniably the most important part of the training engagement. And content considerations usually begin with the choice between off-the-shelf courseware and tailored training help.

"I don't look to customize the material to reflect our own process and business," said HSBC's Iniguez. "I like for our team to get the benefit of understanding what's used in the industry so that we can better determine how we can use that and apply it to our business."

Off-the-shelf packages are invariably cheaper, relatively more abundant, and when delivered online, more convenient for developer teams who can work through modules at their own pace. Yet this canned content often is impotent to address especially gnarly technical or organizational problems.

"I think it's much easier for technology organizations to realize they don't know a particular tool, technology or language and go for point training for it," said Galen. "What seems to be harder for many is detecting more amorphous training needs. For example, leadership skills, facilitation skills, project management skills and process skills seem to be areas that are often overlooked."

Negotiating about course material also provides a chance to learn about the trainer. Especially in advance of any highly tailored training engagement, the instructor should be working hard to learn about the particular organizational problem and establish some reasonable plans for solving it.

"I'm not saying you should play dumb and let the trainer do all the work; you need to think through and articulate what you want the outcome to be," said Atlas' Arneson. "But the trainer should have a lot of experience to help you in this process. If they seem unwilling or unable to help you formulate the appropriate material and outcome, there may be a mismatch. Obviously with off-the-shelf or moderately tailored training, the degree to which this happens is less, but they should still be willing and able to guide you."

TIME-SHIFTING

Clicking through the gobs of training offerings from big vendors and solo consultants alike, it's easy to become somewhat bleary-eyed. One may ask, Where exactly did all these choices come from? And where is all this training business headed?

The answer to the first question, according to William Rice, is that software training itself has become a bona fide industry during the previous few decades.

"When I started my career, development managers and teams didn't realize that training is a profession with its own certifications, science and methodologies," said Rice, a New York

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Training Options

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City-based consultant who's been developing software training and documentation since the late 1980s. "So they tended to search for people who knew the subject area being trained and the tools used to create the training material."

Today, training is a recognized profession, Rice continued. In addition to basic knowledge of the subject area, trainers are evaluated on their ability to create computer-based-training modules or online courses. Various software tools—Rice mentioned Viewlet Builder and Captivate as examples— are making it easier to rapidly bang out e-learning offerings. And these offerings are necessary given demands for shorter, Web-based and just-in-time training sessions.

At least two future trends may loom on the training horizon.

The first is the rise of blended learning, an interchangeable combination of synchronous and asynchronous classroom and online instruction. Virtual labs constitute one technology making blended learning possible.

These labs, which automate the provisioning of live software environments, allow developers to "create sandbox environments where they can practice and fail without risking their workstations," said Marcus MacNeill, director of product strategy for virtualization vendor Surgient.

The second trend is percolating interest in Information Technology Infrastructure Framework, or ITIL, among the training community. Many trainers already deal in the alphabet soup of training practices. Yet ITIL, developed by the U.K. government in the 1980s as an attempt to achieve quality and value in the government's IT activities, is unique in its focus on services.

"I believe ITIL fills a huge, gaping hole," said Koch. "Most of the things that have been available to date—PMBOK, CMMI, PSP/TSP, Agile—are project-oriented. However, most organizations I work with have issues around ongoing operations and services—things that don't really fit the definition of 'project.'"

Koch's only problem is that he finds himself somewhat shy of ITIL expertise at the moment. So he's shopping around for—you guessed it—training help.

"I am in research mode on ITIL right now," said Koch, "and will get my first ITIL certification next month." ▮

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EDITORIALS

Time for a U.S. Cybersecurity Chief

Software development managers, working in the private sector, probably don't want their governments setting rules and regulations for secure programming practices. But guidance, and visibility for computer security at the highest levels of government—that's important, not only to emphasize the critical need for security, but also because there are unique resources that only governments can provide in terms of research and prescriptive measures.

That is why the failure of the U.S. Department of Homeland Security to fill the position of cybersecurity chief, which has remained open for nearly two years, is disgraceful. Not only does the United States have a large, and growing, computer security problem, but software development is an area in which the U.S. is generally seen as a leader and innovator, and a positive influence for change. But not in cybersecurity.

We acknowledge that the appointment of a politicized cybersecurity chief, who will assume the title of formal assistant secretary for cybersecurity and telecommunications, truly is a symbolic gesture. But symbols are important. Naming an individual to that post will serve as a formal acknowledgment from the U.S. government that secure coding practices play a pivotal role in preventing unauthorized access to consumer information and other key data.

Having a cybersecurity chief will also prompt the Department of Homeland Security—and potentially, other governments—to implement a 2-year-old set of recommendations put forth by its Improving Security Across the Software Development Lifecycle task force. But until the U.S. government accepts its own recommendations, it is unlikely others will follow them.

While government procrastinates, the private sector, driven by the profit motive, has moved ahead in educating development teams and senior management about secure coding practices, and in creating new products and services to help write better software. And even though the subtext of their message is clearly "buy our tools," these software companies are doing a better job than the U.S. government.

Government can and should serve as a neutral source of knowledge. The world has benefited from the work done by the U.S. National Institutes of Health and Centers for Disease Control, for example. While certainly computer security isn't a problem of *that* magnitude, the U.S. government has an obligation to fill its own open position. Today's government places an emphasis on protecting the homeland. It's time to appoint a cybersecurity chief.

Set Your Java Children Free

Sun Microsystems recently revealed part of its plan to make available the source code for Java Standard Edition and its Java Micro Edition. Bad move. Releasing Java ME as open source could spell disaster for a marketplace of mobile devices that is already severely fragmented.

Although Sun has kept the details of its open source plans mum, we believe the potential for further forking is very real.

In precisely the same way that Linux has become fragmented—requiring consortia such as the OSDL, LiPS and CELF to fight for standardization—so too might Java ME further divide, exacerbating the already convoluted maze of mobile targets that carriers, software companies and developers everywhere are forced to navigate.

To prevent this nightmare scenario, Sun needs to say it will not only accept input in terms of its distribution license, as it has done, but also actually put that input into practice. After that, Sun needs to step aside and let its Java children stand on their own. It can't truly open-source the software while reserving the right to define the specification.

If it succeeds, the potential exists for Java, already dominant in the mobile space, to become the only runtime for mobile phones. The stakes could not be higher. As Sun's James Gosling notably remarked, the cell phone is tomorrow's desktop. ▮

New Strategies Reflect Outsourcing

Under increasing market pressures, organizations continue to focus on fostering core competencies while offloading non-core activities. Discussions about which software development activities fit into "core" and "non-core" buckets are commonplace today, and nearly every company with a software R&D function has an outsourcing strategy.

Frederic Boulanger

In 2003, according to a study published in Software Development magazine, 23 percent of software companies in North America said they were outsourcing some portion of research and development. By 2005, that had grown to 29 percent—it is estimated that the trend is growing at an annual rate of 30 percent. In industries like automotive, pharmaceutical and electronics, 90 percent of firms outsource some portion of R&D.

The conversation today has shifted from a question of outsourcing to how it can be made to work. The most sophisticated organizations use a variety of software talent in their outsourcing mixes. While the optimal outsourcing composition will vary between organizations, managers of successful R&D outsourcing models respect four important truths.

FOUR TRUTHS OF OUTSOURCING

First, they know that outsourcing does not equal offshoring. They recognize a range of third parties that may fit into the overall outsourcing mix. Sophisticated outsourcing models typically include at least four different types of labor options: in-house teams, sub-contractors within the same city (or even the same office), specialized firms on the same continent, and development houses overseas. Today's R&D managers are experts at evaluating a particular project's unique profile and matching the right mix of outsourcing vendors to the project.

Second, organizations with optimized outsourcing strategies know that outsourcing does not mean "over the wall." They respect that an outsourced project requires at least as much management as an internally hosted project, and they evaluate what management style will be required. This can range from fully hands-on oversight to nearly total automation—and a range of scenarios in between.

Third, they know that sending work offshore is not necessarily cheaper. In fact, many may have been burned by projects that were blindly offshored during the tech downturn—not because the offshore vendor was incompetent, but because the project was unsuitable for a foreign vendor. Today's more experienced R&D managers look at more than hourly labor costs—they also evaluate a project's overall profile and map that to an appropriate outsourcing mix.

Finally, successful outsourcing models recognize the difference between IT software projects and product development projects, and they outsource accordingly. Whereas IT developers never have to look at the codebase, product development requires expertise to make a platform do what it wasn't supposed to, with the ultimate goal of getting first-to-market. This focuses on innovation, on reading between the lines to turn a never-been-tried idea into a winning product.

READING BETWEEN THE LINES

Not every software development project requires a high degree of innovation. Many projects—such as those with highly detailed requirements specifications, or those surrounding maintenance of mature products—can largely be controlled by automated processes and tools. In these situations, minimizing costs and maintaining product margins are of paramount concern, and due to the controls in place, these are low-risk projects to outsource. Offshore firms, particularly in India, have proven their value in these projects.

But, while talk about outsourcing software R&D tends to raise thoughts of India almost immediately, India is not the whole story. In fact, as a legion of failed offshore software projects attest, a more sophisticated approach to outsourcing needs to be considered, in particular for projects that are time-sensitive, or that require a high degree of innovation.

Products like those in the early stages of development, "one-off" projects for a specific customer, urgent projects with short timelines, or highly experimental projects that require a specific skill set are ideal candidates for outsourcing to near-shore partners. Software development firms that are "near" to you in time zone, culture or location offer the advantages of outsourcing without the linguistic, cultural and time zone distractions that offshoring entails.

In Canada, where I live, such firms are carving out a niche in the successful delivery of highly innovative or time-sensitive projects. They are adding significant value to in-house North American teams that may be unable to tackle those projects due to availabil-

Maturity

ity, skills gaps or cost considerations.

Perhaps more importantly, outsourcing partners within North America share your culture and ideally have a wide range of relevant product and industry experience. So, a great deal can go unsaid or undefined. In a good near-shore relationship, the partner will intuit your needs to a degree that is not achievable when working with offshore vendors. A near-shore partner who understands the product development environment will be able to read between the lines.

For example, a near-shore partner can fill in the gaps between a high-level need (e.g., "We would like to build a softphone for WiFi-enabled devices"), and all the details of execution that need entails, without needing the details on paper. In fact, the partner's capability should include a strong user interface design practice, and the ability to flesh out and define a project based on a high-level expression of need.

THE RATE GAP

You may be thinking, "But North American wages are four times higher than what I'd pay for offshore development. At that price, I can afford some screw-ups and delays." But low labor rates are no guarantee that a project will save a software firm money. Hard experience has taught many firms that, when the wrong type of project is outsourced offshore, the cost of misunderstandings and delays quickly outstrips the cost of having a better-suited near-shore vendor perform the work. This is especially true of time-sensitive projects, where the cost of ramping up an offshore team can quickly eat up any rate-based cost savings.

It's also worth noting that, just as the approach to outsourcing has evolved and matured to embrace a variety of vendors—including local, near-shore and offshore—so, too, has the near-shore business model. Sophisticated near-shore vendors have global teams, giving them the advantage of global costs in addition to innovation, experience, speed, response time and the agility of a core innovation team.

When combined with the right set of development processes, close—and closely managed—relationships with firms overseas help near-shore vendors to deliver products at lower cost, with no sacrifice in time-to-market or quality. By extension, the organizations that partner with these near-shore vendors are able to deliver effectively on their product commitments—faster, more efficiently, and with high quality. ▮

Frederic Boulanger is president and CEO of Macadamian, a Canada-based software company.

Don't Write Your E-Mail

Zeichick's Take

Software developers write a lot of e-mail, and a lot of it isn't well-written. No, I don't mean the messages that you send to your team about tomorrow's pizza lunch, or the status report for project requirements, or that really lame joke that's going around the office. I mean the e-mail messages that are programmed into server-side applications, such as confirmation messages when someone buys something from your Web site or requests a new password, or even alerting them that there's a pending inventory transaction in a queue.

All too often, those messages—which are sent by the billions to customers, partners or suppliers—are composed and programmed by someone in the IT department. It might be a systems administrator configuring Exchange or Oracle, or it might be one of your developers hard-coding an SMTP message into a .NET or Java EE application.

Having your developers write the message that says "Dear customer: Here's your new password" or "Dear partner: Your account balance is overdrawn" seems simple. But every external communication from your company should be driven by someone in your sales, marketing or customer-service department. I know it's a pain and that bureaucracy is a nuisance. But that's just how it should be.

Why? Every external communication from your company, including automated alerts or transaction confirmations generated by your server-side apps, affects your company's reputation. To a salesperson, it's an opportunity to improve the relationship. To a marketer, it's a chance to strengthen the company's brand. To someone in your partner relations department, it's a chance to cement a bond.

Or it's an opportunity to blow it. If your e-mails have typos, they look bad. If they don't use the right corporate messaging, your organization has lost an opportunity.

But things can be even worse: If your transactional e-mail messages aren't following industry best practices, they can be caught in spam traps. That means that customers aren't getting your messages, which will potentially cost your company money in lost business or extra support costs. (If it costs your company $1.10—a reasonable industry average—to send out an e-mail confirmation of a purchase, and someone doesn't get it and calls your call center, that call might cost you $10 to process.)

Good messages help the business. Bad messages hurt. I'm writing this from a conference on e-mail communications, where there have been numerous case studies presented that highlighted the dangers, and business costs, of having IT departments write and transmit messages without input from your company's e-mail experts. Yes, that request for a new password or that notification that a customer's monthly bill is ready for download seems innocuous. But it's not a message that your developers should write. ▮

Alan Zeichick is editorial director of SD Times.

Are You Familiar With 'Device Software Optimization'?

DATA WATCH

Device Software Optimization is a term coined and championed by Wind River Systems. DSO is the result of evolving vendor marketing strategies to meet the ever-changing technology landscape and the needs of embedded software developers. It represents a way for the companies that use the term to communicate their recognition of the complexity of device software development through the availability of broader sets of commercial-off-the-shelf software platforms.

But according to research firm Venture Development, only about 41 percent of embedded developers have heard the term—and only about 12 percent say that they understand the underlying message.

Those results, published in late July, mirror the findings in an SD Times Special Report ("DSO: Valuable Strategy, or a New Label on an Old Package?" April 15, page 18), which reported that critics call "device software optimization" a marketing term, while Wind River's chief marketing officer maintains that DSO represents a fundamental change in the embedded software industry.

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BPA WORLDWIDE

Two Views of Ruby, in Plain Language

It Isn't All a Gem

Integration Watch

Several months ago in this column, I pointed to Ruby as a dynamic language worthy of thoughtful consideration for scripting, even for developing entire applications. While my affection for the language remains high, I am concerned about the rampant hyping I keep reading regarding Ruby. Like any language, Ruby has weaknesses that any developer (especially non-Java developers) will quickly recognize. Here are the salient ones.

Long Learning Curve. Many articles talk about the ease of learning Ruby and provide examples of its greater concision when compared with Java. (See Maik Schmidt's Guest View, "Dynamic Ruby Gets Ready for the Enterprise," July 1, page 34, for an example.) Let's be accurate here: Almost any language except COBOL will be more concise than Java, but concision does not make it easy to learn or use. In fact, Ruby is dependent on tricks used in Perl, such as specially named variables that are not intuitive, to provide shortcuts and concision. This design has been widely condemned in Perl because it sacrifices readability. The same applies to Ruby. (Consider these four predefined—and unrelated—variables: $! $-0 $0 and $_ .)

Ruby also uses techniques that derive from printf-style codes. The String unpack command provides 37 format codes for different ways of extracting data from a string. There are 22 codes for booleans regarding a file status. And because most of these codes are used in Ruby, they have to be memorized. Is the code ?S clearer than an API call to test whether a file is a socket? It's more concise, but hardly clearer. To be proficient at Ruby—even to read it easily—you need to memorize these hard-coded syntactical features of the language. Java, C++ and Python, by comparison, require far less rote memorization to learn the language.

The learning curve is hampered by the absence of good tutorials. The bible of Ruby developers is "Programming Ruby" from the Pragmatic Programmers (Dave Thomas and Andy Hunt). It's a decent reference work for the language and the APIs, but insufficient as a tutorial. It lacks the steady development of code of increasing complexity to bring the reader along from simple to large complex applications. It is nothing like the terrific tutorials by the same authors on other programming topics. Moreover, there are few alternate resources, although several books are finally on the way.

Slow Execution. Ruby is translated; there is no concept of VMs. As a result, performance is distinctly sluggish. Oddly enough, this lack of translation to an efficient binary format is touted as an advantage by many evangelists because skipping the compilation step is perceived as such a timesaver. This either/or view reflects a lack of knowledge of alternatives. Dynamic languages today can be both interpreted and compiled. For example, Groovy and NetRexx are two languages that can be run interpretively from the command line or compiled to Java bytecodes. The benefit of the latter option is the ability to leverage the years of work that have gone into optimizing JVM performance—something Ruby desperately needs. JRuby, the effort to have Ruby run on the JVM (in the manner of Jython), is one possible solution. However, that project is moving along slowly and has garnered surprisingly little support from the larger Ruby community.

Lack of Tools. Few tools today support Ruby development, and those that do aren't terribly impressive. The principal commercial IDE, ActiveState Komodo 3.5, barely functions well enough to use. It hangs frequently and has limited syntactical support for the language. Remaining dev tools are equally immature. So, developers accustomed to the robust development environments for Java, C/C++ and C# will suddenly find themselves using tools from 10 years ago. Expect to use a plain editor for development and to rely on printf-style dumps of variables for debugging. Fortunately, a tracing facility is built into the language.

Ruby enthusiasts talk about how the language puts fun back into programming. Personally, I think this is true of any scripting language, except maybe Perl. Writing shorter programs that can do a lot is always a pleasure. Ruby on Rails (RoR), the Web framework that runs on Ruby, adds to this pleasure by its truly elegant, intuitive design. More than features of the language per se, RoR is the real reason to adopt Ruby. It has led to a remarkably active community, which gives Ruby additional appeal. Posts to mailing lists are answered quickly and with very little flaming for even obvious errors. However, don't expect a panacea in Ruby, but a language with its own strengths and weaknesses and an acute need for better tools and better performance. ▮

Andrew Binstock is the principal analyst at Pacific Data Works.

Crossing the Chasm

Windows & .NET Watch

Every five to seven years, the programming community embraces a new language: C#, Java, C++, Turbo Pascal, C, etc. Generally, this happens more or less in conjunction with platform disruptions: Web services and .NET, the JVM and the Web, Windows and GUI programming, DOS, etc.

My theory is that once a language "crosses the chasm" into the mainstream, for a few years it is seen as delivering higher productivity with its new libraries and capabilities. Then, for a few years, it is seen as capable, but people start to hear about its shortcomings: It didn't anticipate this or that trend, some projects inevitably fail, and people discover that it is not, in fact, a silver bullet. Finally, the novelty wears off, the language and library innovations are fully internalized by the programmers and thus become "no big deal," and a restlessness for The Next Big Language builds.

While the majority of professional developers work in mainstream languages, academics, gurus and enthusiastic small teams are constantly churning through alternatives.

"Enthusiastic small teams" is a bit unwieldy, but I don't know a better term to encompass the groups that have the self-confidence and flexibility to choose, say, VB in the 1990s or Seaside today. The Next Big Language is first seen within this group, but one historical characteristic is that crossing the chasm involves an explosion of interest: articles, books and conferences emerge, providing positive feedback and creating a buzz that keeps the emerging language in the forefront of discussion.

Ruby is experiencing just such a buzz right now. Ruby has been around for several years, an underdog to Perl and Python in the scripting languages battles, with the notable feature of having a "pure" object-oriented model. Like those languages, Ruby is implicitly typed, which has been framed as de rigueur for productivity (a point on which I disagree).

Also, Ruby is the language of Rails, a Web app framework whose "convention over configuration" philosophy is provocatively contrarian. Perhaps most important, the innovative Pragmatic Programmers publishers threw themselves behind Ruby and produced two best-selling books ("Programming Ruby" by Dave Thomas and Andy Hunt and "Agile Web Development With Rails" by Thomas and Rails creator David Heinemeier Hansson).

According to Tim O'Reilly of O'Reilly and Associates, these books have been the drivers behind a 689 percent quarterly increase in sales of books on Ruby, bringing total sales into the neighborhood of mainstream languages. This success has not gone unnoticed, and the publishing pipeline is stuffed with Ruby and Rails books that will be hitting the shelves this fall. (Meanwhile, on "flash-interest" sites like Digg and Techmeme, Ruby is clearly a successful keyword. Those who track job sites and keywords say that calls for Ruby programmers, while still distinctly uncommon, are expanding rapidly.)

I am not one of those who believe that all programmers share a common mindset, that the popularity of mainstream languages is the result of "brainwashing" and massive marketing.

Instead, I believe that in addition to the previously discussed multiyear cycle and the positive feedback of interest, a particularly helpful library or framework can play a huge role in moving a language into the mainstream. Network programming in Java, for instance, was vastly easier than alternatives using sockets. Today Rails provides one of the fastest routes to creating a custom data-driven Web site. As always, there is no silver bullet: Rails' "scaffolding" is more of a learning tool than a foundation for a production system.

The idea that technologies that appear to be succeeding face a difficult chasm before being adopted by the majority comes from Geoffrey Moore's seminal 1991 book "Crossing the Chasm," which provides the best explanatory model for programming language popularity that I've seen. I believe that Ruby requires only one thing more to cross the chasm: interoperability with one of the two major managed platforms, Microsoft's Common Language Runtime or the Java Virtual Machine. At the moment, JRuby—an implementation of the language targeting the JVM—appears to be closer to feature-complete than competing offerings on the CLR side: Ruby.NET from the Queensland University of Technology and IronRuby from Wilco Bauwer. All of these projects are far enough along, though, that it is clear that Ruby will become available to these environments that dominate corporate development. The time has come for corporate developers not just to keep their eye on, but to learn Ruby. The chasm is being crossed. ▮

Larry O'Brien is a technology consultant, analyst and writer. Read his blog at www.knowing.net.

Just Say No to XML

XML is perhaps the worst programming language ever conceived. I'm not talking about XML as a data-description language, which was its original design. I'm talking about perverting XML for programming applications. It's inappropriate to use XML as a scripting language (e.g., ANT), a test-description language (e.g., TestNG), an object-relational mapping language (e.g., Hibernate, JDO), a control-flow language (e.g., JSF), and so forth. These sorts of XML "programs" are unreadable, unmaintainable, an order of magnitude larger than necessary, and audaciously inefficient at runtime.

So, why would anybody use XML in this bizarre way? As far as I can tell, it's because many so-called programmers just don't know how to build a compiler. I really don't have much patience for this sort of thing. To my mind, there is a minimum set of topics with which you have to be conversant to call yourself a professional programmer. If you don't know these things, you're a dilettante. This list includes a deep understanding of data structures and key algorithms, a little math (set theory, logic, a little statistics), mastery of analysis-and-design techniques, both process (e.g., RUP or XP) and structure (e.g., design patterns), and database structure and use (e.g., SQL). You also need to know how the hardware works.

You need this stuff even if you're not actually using it in your work, because no matter what you're doing, knowing this material will make your work better. How could you possibly decide which of Java's Collection classes to use in a particular situation if you don't know how those classes work under the covers, for example?

Knowing how to build a compiler is certainly one of the skills on this need-to-know list. Compilers are fundamental to what we do every day as a programmer. Knowing how the compiler works will let you make intelligent decisions about program structure, decisions that have real impact on the quality of our programs. More to the point, most programs have to parse input (either from a human being or from a machine) and make sense of it. To do that, you have to build a small compiler. Corrupting XML for this purpose, simply because you happen to have an XML parser lying around, is inappropriate at best.

Basically, you're selfishly making your life easier at an enormous cost to everyone else. For every hour you save, you're subjecting every one of your users to many hours of needless grappling with overly complex, hard-to-learn, hard-to-maintain, impossible-to-read, XML-based garbage. This is no way to make friends and influence people.

Learning how to build compilers is, unfortunately, too difficult. The most widely used textbook, Aho, Sethi and Ullman's "Compilers, Principles, Techniques and Tools," is a classic example of everything that's wrong with academic writing. Its thorough, but impenetrable, coverage of the subject offers virtually no practical information. The academicians love it, but I'd recommend avoiding the book unless you have a strong mathematical background and are interested more in the underlying math than practical application.

By contrast, Watt and Brown's "Programming Language Processors in Java: Compilers and Interpreters" is a great practical introduction to the subject. The authors take a learn-by-doing approach, presenting the complete sources for a compiler and interpreter in Java. Though this book is probably the best introduction to compilers for Java programmers, the Java itself is not particularly well done. It's very procedural (using lots of public fields, for example), doesn't use polymorphism particularly well, uses way too many impenetrable single-character variable names, and other bad things. As long as you mentally separate the compiler topics from the Java ones and don't take the Java as a model of good programming practice, then the book is fine.

Kaplan's "Constructing Language Processors for Little Languages" is another good introductory text with plenty of (unfortunately C++) code in it.

By the way, my own "Compiler Design in C" also has vast amounts of code in it, but it's obviously all C, not Java. My book shows you not only how to build a compiler, but also how to build the tools that you need to build compilers. (I provide full lex and yacc implementations.) When you're done learning and moving on to doing, there are a bunch of tools available to help you build compilers, most of them free.

"The Catalog of Compiler-Construction Tools" (catalog.compilertools.net) is a great compendium of every tool that I know of. There's not much point in looking at this site unless you've read a book on the subject first, but once you have, it's a great resource. ▮

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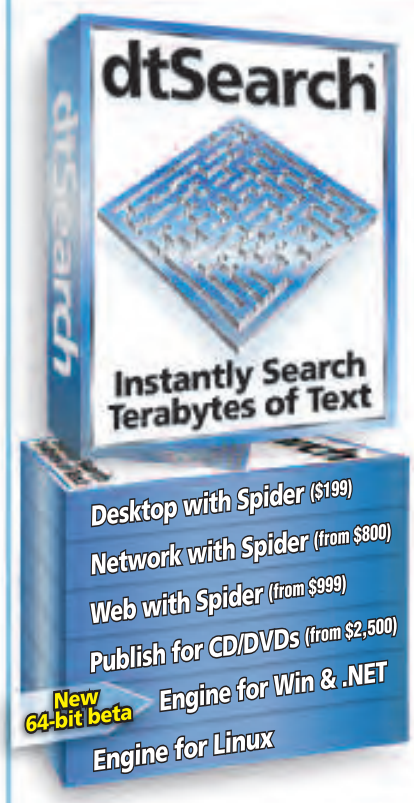

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Behind the Scenes

Yeah, we're busy and behind schedule. Sure, there's a lot on the line with this next release.

But last month, we set aside two days to bring our team together—off-site, away from the ringing phones and demands of our executives—to tear apart SD Times and our processes for creating it, all with the idea of making it better going forward.

Industry Watch

So for this column, I'll give you a look behind the scenes at our editorial meetings. Although the sessions were just for our small group, we tried to set it up in as formal a way as you might find at an industry conference, with some of us assigned the task of presenter, times affixed to each session, and coffee breaks and after-hours events as well.

At the first session, we spoke about how the Internet has changed the delivery of news; how many vendor Web sites, it seems, strive to offer some kind of news or information or blog to keep customers coming back for fresh information. We discussed what the competitive pressures on SD Times are, and how we are facing them—even winning, in many, many cases.

We spoke about how we develop our stories, how we cultivate our sources of information, and how important we believe context is to provide some perspective around the news and events we cover.

Deadlines were a hot topic. Writers always want to hold on to their work until the last possible moment, searching for that elegant turn of phrase to bring their prose to life. Editors, understandably, don't want to be buried under an avalanche of last-minute stories that all have to be read for content, grammar and style.

The look and feel of the newspaper also is important to us, and our readers. Graphics, color and photos all were dissected—why did we use them, why didn't we use them, why didn't an important story have a better illustration?

All of which got me to thinking…producing software and putting out a newspaper have quite a bit in common.

First of all, we need to know our requirements—in our case, it's asking if the stories proposed at our news meetings meet our mission of providing timely, accurate, unbiased information to our core reader base of software development managers in enterprise organizations.

Then, we need to follow the established development process. Just like many software shops around the world, the process for developing each issue of SD Times is kind of a homegrown methodology, cobbled together from the best practices learned by each individual over the course of many years in the publishing industry.

Testing is a little different. On one level, we test it during the development process, as we proofread and fact-check. But on a higher functional level, we can test only how well it met your requirements after it's been released. And the way we do that is through reader feedback—when you tell us what you like or don't like, we try to incorporate that information into the next "build."

We have to deal with advertisements coming in from outside sources. Much like Web services, it's important that all the components of SD Times are developed to the same specifications, or else the newspaper won't look very good.

Finally, our physical production and distribution—that is, printing and mailing—is outsourced. So there are issues of managing the print process from a remote location, understanding when and how the print shop works, getting to see page proofs before the paper is put on the press, and more. And then, of course, the finished newspapers are delivered to the post office.

Setting aside time to meet as a team is critical to improving the process, and the product. I have heard from developers who are sent to conferences by their companies but then are never asked to write up a report about what they've learned, or to lead a session with their team members to explain what they found out at that conference. The knowledge benefits only the one, not the many.

I know it's difficult for some team members to give their opinions or share their knowledge, for fear of angering or upsetting a manager or co-worker. Gathering at a neutral site helps level the playing field, and can make everyone on the team feel more comfortable about speaking.

It's important to encourage all members of the team to participate. After all, they were hired because of their skills, and because of what they bring to the table.

If that table is seeded with coffee, muffins and other snacks, away from the boss's office, a different kind of productivity can be had that can only make your products better in the long run, whether that product is a newspaper or a software application. Ultimately, they're very much the same. ■

David Rubinstein is editor-in-chief of SD Times.

BUSINESS BRIEFS

IBM AUGUST ACQUISITIONS TOP $2B

IBM completed a trio of acquisitions last month, designed to bolster its position in the SOA, asset management and content management markets.

First, IBM announced it had acquired privately held **Webify Solutions**, an Austin, Texas-based company that sold software and services for industry-specific service-oriented architectures. Financial terms of the deal were not made public. IBM said it will roll Webify's software into its WebSphere brand and that it will make the software available through its Global Services.

Then, the company announced a definitive agreement to buy **MRO Software**, which sells asset and service management software, for US$740 million. This software will be integrated with IBM's Tivoli offering. "In a recent IBM study, 40 percent of CEOs indicated that asset utilization would be a key focus in strengthening financial performance," said Al Zollar, general manager of IBM Tivoli software. The deal is expected to close in the third quarter.

Finally, in mid-August, IBM said it will spend about US$1.6 billion to acquire **FileNet**, a 24-year-old maker of document and content management solutions.

IBM said it will integrate FileNet's tools with software offered by its information management division and with its existing business process management tools, as a way to bolster its information-as-a-service strategy. The deal is expected to close by the end of this year.

SAP's global NetWeaver Fund has made its first investment, placing US$125 million with remote device management software company **Questra**. The Questra Remote-Service Composite Application helps organizations monitor devices remotely and automatically create and send service notifications via SAP's Service and Asset Management software.

EARNINGS: Raining Data announced net revenue of US$4.7 million for its first fiscal quarter of 2007, ended June 30. That's a decline of about 12 percent from the same quarter in the prior year, when revenue was $5.3 million. Net loss for the quarter was $1.1 million; for the same year-ago period, the company posted a net loss of $200,000. Raining Data sells XML database management and information aggregation software . . . Integration software provider **Magic Software** reported US$15.2 million in revenue for its second fiscal quarter 2006 ended June 30. That marks a slight decrease from the $15.7 in revenue from the same quarter a year earlier. The company posted a net loss for the quarter of $1.33 million, or 4 cents per share, compared with a net loss of $1.16 million for the same period in 2005. "Our disappointing results this quarter can be attributed, to a large degree, to serious management problems at one of our major European subsidiaries, which has forced us to make a thorough re-structuring of our branch," said David Assia, Magic's chairman and CEO, in a statement. Magic is based in Or Yehuda, Israel. ■

CALENDAR OF EVENTS

EclipseWorld 2006 — Sept. 6-8
Boston
BZ MEDIA
www.eclipseworld.net

Austin Game Conference — Sept. 6-8
Austin, Texas
THE GAME INITIATIVE
www.gameconference.com

VSLive — Sept. 10-13
New York City
FAWCETTE TECHNICAL PUBLICATIONS
www.ftponline.com/conferences/vslive/2006/newyork

SD Best Practices Conference — Sept. 11-14
Boston
CMP MEDIA
www.sdexpo.com/2006/sdbp

High Performance on Wall Street — Sept. 18
New York City
LIGHTHOUSE PARTNERS & FLAGG MANAGEMENT
www.highperformanceonwallstreet.com

Application Development Summit — Sept. 25-27
Phoenix
GARTNER
www.gartner.com/2_events/conferences/ad8.jsp

Embedded Systems Conference Boston — Sept. 25-28
Boston
CMP MEDIA
www.embedded.com/esc/boston

Intel Developer Forum — Sept. 26-28
San Francisco
INTEL
www.intel.com/idf

Open Source Summit — Sept. 27-29
Phoenix
GARTNER
www.gartner.com/2_events/conferences/os2.jsp

AJAXWorld — Oct. 3-4
Santa Clara
SYS-CON MEDIA
www2.sdtimes.com/ajaxworld/ajax_062606.html

Symposium/ITxpo — Oct. 8-13
Orlando, Fla.
GARTNER
www.gartner.com/it/sym/2006_/sym16/sym16_home.jsp

Mercury World — Oct. 8-11
Las Vegas
MERCURY INTERACTIVE
www.mercuryevents.net/mercuryworld/home.cfm

STAR West — Oct. 16-20
Anaheim
SOFTWARE QUALITY ENGINEERING
www.sqe.com/starwest

SoftSummit — Oct. 17-18
Santa Clara
MACROVISION
www.softsummit.com

Development Products Conference — Oct. 19-20
San Jose
EVANS DATA
www.evansdata.com/dpc

Software Test & Performance Conference — Nov. 7-9
Boston
BZ MEDIA
www.stpcon.com

For a more complete calendar of U.S. software development events, see www.bzmedia.com/calendar.
Information is subject to change. Send news about upcoming events to events@bzmedia.com.

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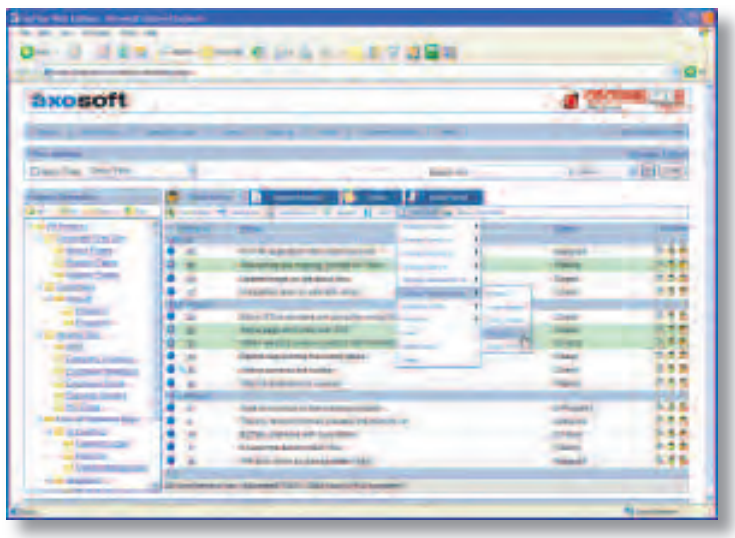

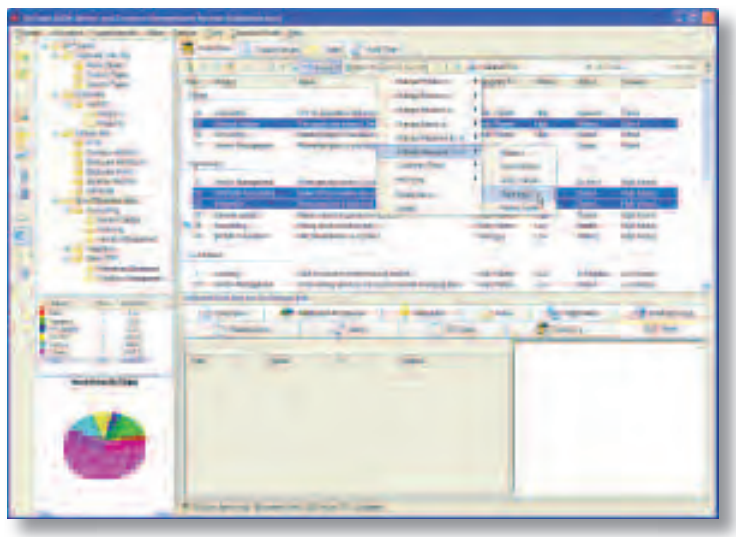

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